A M E R I C A N P O U L T R Y
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LESSONS No. I & 2.
Poultry House Construction.

LESSONS No. 3 & 4.
Modern Poultry Houses.

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Principles of Mating and Breeding.

American Poultry School—
General course for poultry
husbandry.

Poultry House Construction

By T. E. QUISENBERRY

Lesson No. 1

THE QUISENBERRY FOOL-PROOF POULTRY HOUSE

The more nearly "fool-proof" a poultry house can be made, just that much more certain will the average person be of succeeding in the production of poultry and eggs at a profit. By fool-proofness we simply mean that the house, its ventilators and windows need but little adjustment, being always ready for use. The interior of the house is protected from rain, drafts and storms. As someone has well said: "The shutter ventilator is to the hen house what the 'block system' of signals is to the railroad—it does not depend on the falibility of human memory, adjustment or correct use; it is always in place and in working order, no matter what the weather may be."

The facts which are contained herein, and the houses which are herein illustrated are the results of the experimental work with poultry housing problems which I did at the Missouri State Poultry Experiment Station. I have made certain alterations in this lesson and improved the house where I thought necessary. I originated this idea for ventilating a poultry house.

Much of the loss and many of the ills and disappointments met with in poultry raising can be traced directly to nonsensically-designed, poorly constructed, badly-ventilated, inconveniently-arranged and improperly-located poultry houses. A poultry house need not be elaborate or expensive. The Quisenberry '"fool-proof" poultry house can be easily and economically built. It was designed with a view of economy, simplicity, comfortableness, convenience, dryness, cheerfulness, sanitation, and of having the proper amount of ventilation and sunshine. It was designed with a view of having all these virtues in one house and at the same time avoid having a lot of curtains to raise and lower, and is free from many of the freak notions and ideas embodied in many modern poultry houses which make it necessary for the farmer or poultryman to be continually raising and lowering curtains, opening and closing ventilators and doing many other things which the average farmer or poultryman will not take the time to do, and therefore do not get the best results. The attention to details is all eliminated in the Quisenberry "fool-proof" poultry house. We unhesitatingly recommend it to the farmer, the city back-lot poultry-raiser, the commercial egg farmer and all others desiring the most up-todate and satisfactory poultry house in existence.

Before attempting to build a poultry-house, first consider the purpose for which the house is intended and the size of the flock it is to accommodate. Is it to house a pen of breeders, is it to be used as a colony house, or is it intended as a sort of general purpose house or a laying house? Consider these facts, then build the style and size of house which comes nearest filling your requirements. This book describes and contains plans in detail for the colony house, the breeding house and the laying house, all similar in most respects—varying only in size and interior arrangements.

Judging from appearance, as a rule, any old shack is a perfectly satisfactory home for the hens. Of course there are exceptions, but, taking the states over, the average farm henhouse is 'fearfully and wonderfully

made." It is dark, damp, dirty, full of cracks and with the cracks full of mites in too many cases.

And yet there is no class of live stock on our farms that will more quickly repay their owner for a good home than will the hens. One winter egg is worth from three to five summer eggs, and the greatest single essential to winter egg production is the proper kind of a house. Again, improper housing is the contributing cause of many poultry ills. By seeing to it that our hens are properly housed we will advance ourselves well along on the road to success in the poultry business.

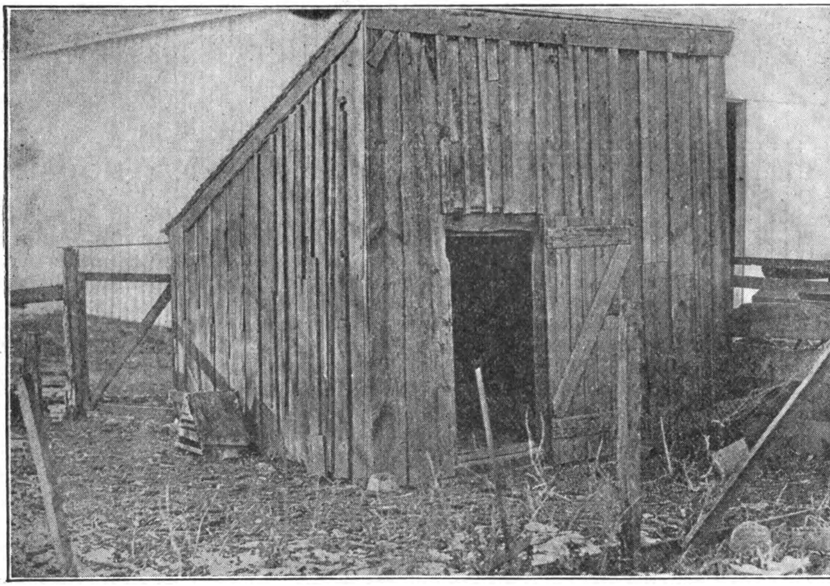


Fig. 1.

Good houses for the rest of the farm live stock but such as this for hens. Cracks and crevices permit a draft in the house. Good hiding places for mites. Not much chance for winter eggs in a house like this.

With this thought in mind, there was carried on for five years at the Missouri State Experiment Station a series of experiments or tests to determine, if possible, whether there was any particular style or type of poultry house which was better adapted to Missouri conditions than any other. In this test all of the various styles of poultry houses in general use were carefully compared with a house which is new in its essential features, and which has since been named "The Quisenberry Fool-Proof Poultry House."

In each of these houses a government thermometer was kept from which readings were taken twice daily throughout the entire period of the test. A careful trap-nest record was also kept of the egg production in each house, as well as of the number of hens getting sick, deaths, etc. As a result it was found that the Quisenberry "fool-proof" house was an easy winner in the following respects:

(1) Uniformity of temperature.
(2) General healthfulness of the flock.
(3) Egg production.
(4) Economy and simplicity of construction.

Before we discuss the plan of this house in detail let us consider, briefly, some of the principles and problems of poultry house construction. A good poultry house need not be expensive—in fact, should not be. Frills won't make winter eggs. Tens of thousands of dollars have been foolishly spent on elaborate poultry houses, designed to please the fancy of their owners rather than to satisfy the actual needs of the hens that were to occupy them.

A practical poultry house should afford perfect protection from storms, plenty of sunshine during the winter months, and an abundance of fresh air, without drafts. It should be absolutely dry, for dampness is fatal to poultry. The house should not cost much over one dollar and a half per hen for which it is designated to accommodate. The prices of materials vary in different sections. We would recommend trying to cheapen the house without altering the principles involved, if the cost should exceed an average of $2.00 per hen. Build it more cheaply if possible. The houses which are herein illustrated and described fulfill all of these requirements to an admirable degree.

THE IMPROVED FOOL-PROOF POULTRY HOUSE

This house is suitable to all climates, and the method of ventilation takes the carbon dioxide or the bad air away from the floor in winter months. We do not hesitate to recommend this plan to any and all poultrymen as one of the best designs for a poultry house that has yet been made public. In fact, it is so nearly perfect, that it can scarcely be improved upon.

In an extreme southern climate or where it is warm most of the year, the poultryman could have most of the space above the shutter ventilator covered with a curtain, cloth or shutter on hinges. It could be opened outward in summer and closed in winter.

We call these 'Fool Proof' Houses because the method of ventilation is practically fool proof. That is one of the most essential features of any house.

We recommend the 'Fool Proof' Houses in preference to any we have ever used or seen used. You can build them in colony houses 8x12, or in units 10, 12, 14, 16 or 20 feet square, or the large house for one large flock can be built 48x60 feet. All will give equal satisfaction.

LOCATION

The proper location of the poultry house is very important. No matter how good your house may be, if it is located in a low damp place where the yard surrounding it is wet and the land sour, your house cannot overcome all of these evils. It should be placed upon high, well drained ground. We prefer sandy, gravelly or light porous soil. Heavy clay soils should be avoided. They are hard to keep sanitary. If the ground does not drain well, naturally, never place a poultry house on it until you have provided for under-drainage with tile or by open ditches. Water should never be allowed to stand in the poultry yards. A wet soil is colder than a dry one Muddy feet mean dirty eggs, and dirty eggs mean washed eggs and low prices. Dampness breeds colds, catarrh, roup, rheumatism, pneumonia and tuberculosis. Air drainage is also very important. Never locate the poultry house in a low flat place where the air is always damp. Face the house to the south, and, if possible, it is not a bad idea to protect it on the north and west by trees, which act as a windbreak. The ground on which the house is located should preferably slope to the south or east.

The house should be placed conveniently to the other farm buildings and in close proximity to the dwelling house. The feed and water supply should be taken into consideration. If the hen house is placed rather close to the dwelling, they should be separated by a chicken-tight fence. Nothing is more trying on a woman than to have the hens make their headquarters on the back porch or back door step. The hens also prove to be a nuisance on the farm many times, when the mistake was made in placing the poultry house too close to the barns, corncribs, tool sheds, etc. Protect your machinery, vehicles and your back door step from the fowls by seeing that the poultry house and yards are properly located. There is no reason why poultry should become a nuisance on any farm or on any city lot if it is properly handled. Locate the poultry house so that you may make additions to it or to your poultry farm and yards, and thus avoid future expense of moving and remodeling.

SIZE AND SHAPE

The size of the house will vary with the purpose for which it is intended—that is, our "fool-proof" colony house is about eight feet deep and twelve feet long; the "fool-proof" breeding house is built in sections four-

teen feet square; and the "fool-proof" laying house should be built in sections twenty feet deep and twenty feet long or after the style of the large rectangular house 48x60 feet. This length or number of sections in the breeding or the laying houses will depend upon the number of hens which it is desired to keep. Under average farm conditions, for the larger breeds —such as Plymouth Rocks, Orpingtons and similar varieties—about four square feet of floor space should be allowed for each hen. For Leghorns, three to three and one-half feet of floor space is sufficient. We would prefer to provide too much floor space rather than too little. The crowded and congested condition of many farm poultry houses has sapped the vitality of their flocks and resulted in failure in many such cases.

The form of the building influences the cost of construction. Square houses or sections of houses economize lumber.

7x28 feet—196 square feet floor space.

70 feet around

14x14

196 square feet

floor space

56 feet around

In the top figure more square feet of wall space is exposed and there is extra cost in building. Experience has proven that the house should be moderately deep, both from the standpoint of the welfare of the hens as well as economy in construction. For instance, you can see in the figure above that a house fourteen feet square contains the same number of square feet of floor space as does a house seven feet deep and twent-eight feet long, yet the cost of construction is considerably less than the latter. A Quisenberry "Fool-Proof" Poultry House fourteen feet square will accommodate about fifty Plymouth Rocks or sixty-five Leghorns.

THE HEIGHT OF THE HOUSE

The poultry house should be high enough to enable the poultryman to work and not interfere with his head. An 8x12 foot colony house should be about seven feet in front and five feet in the rear. A 14x14-foot laying or breeding house should be eight feet in front and six feet in the rear or at least not lower than seven feet in front and five feet in the rear. The deeper or wider the house, the higher the front should be. The south side of the house should be sufficiently high so the sun can extend well toward the rear of the house. You can change the height to fit your lumber and your needs. The important thing above everything else is the system of ventilation. It will tend to increase the egg yield and the good health of your flock, and will aid you in avoiding dampness, colds, roup and kindred diseases.

THE FOUNDATION

For portable colony houses, we usually build them on 2x8 oak runners, tapered off at both ends, so as to make a satisfactory runner. Some use brick and some stone for foundation material in the stationary laying and breeding houses. Others use posts or allow the sills to rest on the ground. All of these are more or less objectionable. The best foundation is made of concrete. This should be built deep enough to prevent the rats from burrowing under and to keep the frost from heaving. We usually make the foundation wall four inches thick and go twelve to eighteen inches deep. It should be about a foot above the ground on the outside at the high point. A four-inch concrete wall is heavy enough to support the Quisenberry "Fool-Proof" Poultry House.

THE FLOOR

There are three general types of poultry house floors now in use: First, earth; second, board; third, concrete. Each of these three floors has certain points of advantage and disadvantage.

The earth floor is the cheapest and in most common use. There are many serious objections to an earth floor—objections which should preclude its use, except in very rare instances. In the first place, where an earth floor is used there is almost always a tendency to dampness, and dampness is injurious to poultry. In the second place, an earth floor is unsanitary. Wherever poultry is kept there are always more or less disease germs. When once they find lodging in an earth floor, it is a difficult task to get rid of them. In the third place, a dirt floor is dirty, naturally. During the winter months a litter of straw should be kept in the henhouse, in order that the hens may be kept busy scratching during inclement weather. Where the floor is of earth, the straw has to be changed two or three times as often as it would if the floor were of wood or concrete. It the dirt floor should be dry, the dust which the hens raise in scratching is very unhealthy. Where, for purposes of economy, it is decided that an earth floor must be used, about eight inches of the surface of the ground should be taken out and a layer of two or three inches of cinders put in. On top of the cinders a layer of five or six inches of yellow clay should be firmly tamped. The cinders will prevent the dampness from coming up from below, while the clay will make a hard surface. With a good rat-proof concrete foundation wall around the outside, a dirt floor does very well. On account of dampness in some sections it cannot be used at all. If a dirt floor is used it should be filled in so it will be at least six inches higher than the earth on the outside.

Wooden floors are in rather common use and, if they are properly constructed, are usually satisfactory as a floor for a permanent house. It is difficult to disinfect the cracks thoroughly in case of outbreak of some contagious disease. They furnish a splendid harbor for rats and vermin if they are not properly constructed. They are the only floors that can be used in portable houses, and for this purpose they are quite satisfactory. Portable houses are built on runners, thus raising the floor far enough off the ground so that there is little trouble with rats. If you are going to use a board floor, we would recommend that you build it at least two feet from the ground unless you use a solid concrete foundation. This gives the hens a very desirable space underneath the floor where they can rest and wallow, and also prevents rats from harboring underneath. I would also make some provision so that this space underneath the house could be closed in winter to prevent the snow and cold rains from beating underneath the house and making it damp. Whatever you do, see that the floor is perfectly tight. A board floor put in as we have suggested and by raising it two feet off of the ground makes a very satisfactory floor for a poultry house. We would prefer it to an all dirt floor. Also see that this space beneath the house is kept clean and disinfected, and your hens will make good use of this space.

A rat-proof board floor with a concrete foundation is one of the best floors that can be used. We recommend its use. If you prefer a board floor to concrete, we would recommend putting in iron ventilators in the sides and ends of the foundation, which will admit ventilation under the floor and, at the same time, make the floor rat proof. You can lay a double floor if you want it extra good and dry, but in most climates a single floor answers every purpose. A dirt floor might be used inside of the concrete foundation in some sections, but we prefer either a board floor constructed as stated above, using a concrete foundation, or else a good concrete floor. Concrete floors must be built in the spring or summer to give them time to become thoroughly seasoned and dried out before winter. Also, provide for plenty of underdrainage, or put a string of tiling every four or six feet just underneath the floor and let it extend from one side of the foundation to the other. The air in passing through will keep the floor perfectly dry.

You can cheapen your poultry house by using a board or a clay floor. A concrete floor is more expensive, and a good board floor with a concrete foundation will give excellent service. Build a good house so you will

have dry, comfortable quarters with proper ventilation and you can add a better floor later on if your finances will not permit of the best at the beginning.

A floor of concrete has so many advantages and so few disadvantages when properly constructed that a farmer who wishes to build a really good henhouse should use a concrete floor or a rat-proof board floor with a concrete foundation. However, a poorly and improperly constructed concrete floor, which is always damp, is worse than no floor at all. A concrete floor is more sanitary than any other. There are no cracks and crevices in which the disease germs can lurk, and it can be quickly and thoroughly disinfected by simply seeing to it that the surface is thoroughly wet with the disinfecting solution. The concrete floor will last a lifetime, and it costs but very little more than a good wooden floor. Properly constructed with a concrete foundation, there will never be any trouble with rats and vermin in connection with it.

Two or three objections to concrete floors have been raised. The first of these is that they are too cold. The second is that they are too hard and that heavy chickens dropping down on them get bumblefoot, rheumatism, etc. The third is that hens scratching on them wear their toe-nails off. Concrete floors are almost ideal if four to six inches of dry clean straw is kept upon them. If care is taken when the floor is made to trowel the surface perfectly smooth with a batter of pure cement and water, very little trouble will be experienced with the hens wearing their toe-nails off too short.

For the average hen you should allow about three and one-half to four square feet of floor space, and chemical analysis shows that in a house with this much space to each hen with a dirt floor the soil becomes contaminated to a depth of twelve or fifteen inches in a year. To be compelled to remove that much soil twice a year makes an earth floor more expensive in the end than a concrete floor. Concrete floors also prevent rats from stealing eggs, fowls and feed. The main thing is to see that you provide for plenty of drainage under your floor and get the floor a foot higher than the level of the ground. Build it in the spring or summer and give it plenty of time to dry out before using.

CONSTRUCTING A CONCRETE FOUNDATION AND FLOOR

Any farmer can make a first-class concrete foundation and floor if a few simple rules are followed. A great many people imagine that the services of an expert are required in order to do good cement work, and therein lies the main reason why more of this valuable material is not used on the average farm.

The materials required for making a concrete foundation and floor are a good grade of Portland cement; clean, sharp sand and gravel or chatts; and rough lumber for making the forms. About sixteen sacks of cement and five and one-half yards of sand and gravel will be required to make a foundation and floor for a henhouse fourteen feet square. The same lumber can be used in the forms that is later used in building the house.

Plenty of coarse rocks, bricks or cinders should be put under the floor for under-drainage. Or, if a layer of four-inch tile is placed immediately under the floor and the tile extends from one side of the foundation to the other, the air will pass through this and keep the floor dried out. The layers of tiling should be placed about every six feet. When tiling is used, it is not necessary to use coarse rock or soft bricks in the foundation. In every case, a concrete floor should be made in the spring or early summer so it will have an opportunity to become thoroughly seasoned and dried out before the damp days of fall and winter. Many concrete floors prove damp and unsatisfactory the first season because they are constructed late in the year and are used while they are green and unseasoned.

In preparing to make the foundation, the first thing to do is to mark off the size of the house and set up the outside forms. A spirit level should be used, in order that the top of the forms which are to determine the surface of the floor may be exactly level. The forms should be well braced on the outside. (See Fig. 2.) See to it that the top of your foundation is about 8 to 10 inches above the ground at its highest point.

After the outside forms are set and leveled up, the next thing is to dig a trench four inches wide just inside of the forms all the way around. This trench should be dug deep enough so that the ground will not freeze underneath it in winter, thus causing it to heave. Twelve inches deep will be enough in most places, not over eighteen inches at most.

We are now ready to put in the concrete. The mixture for the foundation should be seven parts gravel and sand or chatts to one of cement. Mix the dry cement and gravel thoroughly, and then wet it down. Stir the mixture with a shovel or turn it over while the water is being added and keep adding water until the mixture is slushy and thoroughly wet.

Fill the trench with the mixture, level with the surface of the ground, tamping it down quite firmly. This done, you are ready to set up the inside forms. The top of these forms should be three inches lower than the top of the outside forms, in order that the floor may be laid over the top of the foundation, making a neater, smoother job.

After the inside forms are properly set and braced, fill in the concrete mixture, so that when tamped down the foundation will be level with the top of the inside forms. After the foundation has had one or two days in which to let the cement "set" the inside forms can be removed, and we are ready to put in the floor. Bolts should be put in the foundation so that the 2x4 sills may be bolted to the floor and foundation.

In preparing to put in the concrete floor the first thing to do is to fill in the interior of the foundation wall with earth, cinders and gravel, thoroughly tamped down, even with the top of the foundation. This done, we are ready for the concrete. (Fig. 4.) The first layer of concrete should be mixed in the proportion of one part cement to seven parts gravel or chatts. This first layer should be about two inches deep leaving room for a top coat one inch deep. For the top coat only clean sharp sand should be used. It should be mixed with the cement in the proportion of one part cement to two parts sand.

After the top coat is on, the surface must be made very smooth. This can best be done by mixing up a batter of pure cement and water, and

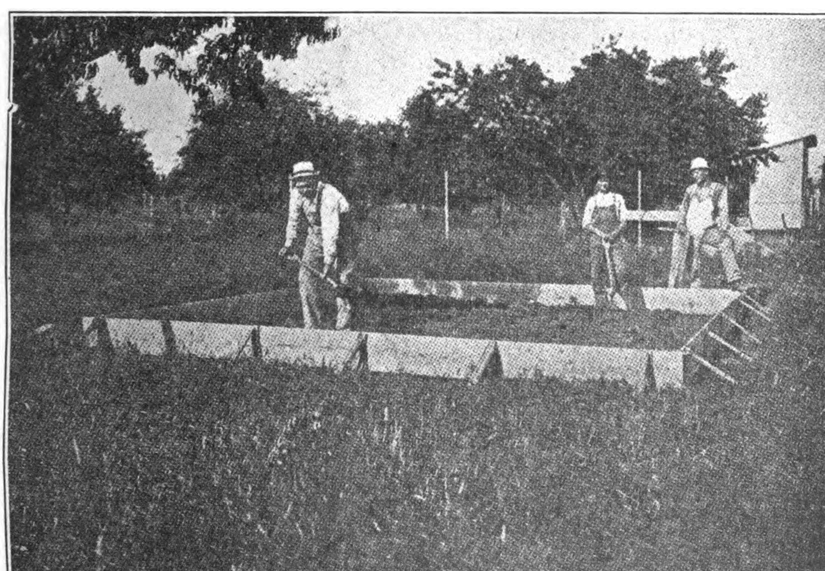


Fig. 2.—The plan of putting in the forms for concrete foundations and floors. A one-foot board braced with stakes and braces makes a good and simple form for the foundation. Have the top of the boards level and let this be the top of the floor. Dig a trench four inches wide and twelve inches deep on the inside of the form. Fill this with concrete, and this forms the foundation and makes it rat-proof.

troweling it down carefully. If the weather is hot and dry, the floor should be covered with two inches of wet sand after the surface has had two or three hours in which to harden. The moist sand prevents the floor from drying out too rapidly and makes a harder finish. The forms may be taken down after two or three days, but the floor should be let stand a week before the balance of the building is put up. You may go to work on it in two or three days if you are careful and not allow lumber or tools to fall on the concrete and crack it or chip off pieces. A concrete floor constructed in this manner is easily cleaned, is dry, durable and economical. It is rat-proof and dry and is one of the best floors which can be used in any poultry house. The main things which must not be forgotten are that the foundation and floor must be about a foot higher than the ground at the exterior of the house; fill in just underneath the floor with a few loads of cinders or small stones and gravel; do not make the floor more than about three inches thick, and be sure that the last finish or top layer of the floor is a batter of pure cement and water. (See Fig. 4.) Spread a thin layer of this over the floor and allow it to become partially dried out or hardened until it trowels nicely; then trowel it until it is perfectly smooth. This will last a lifetime and give you perfect satisfaction. It is one of the cheapest floors in the end. Be sure to put in gravel, cinders or rock underneath the concrete floor for drainage if no tiling is used.

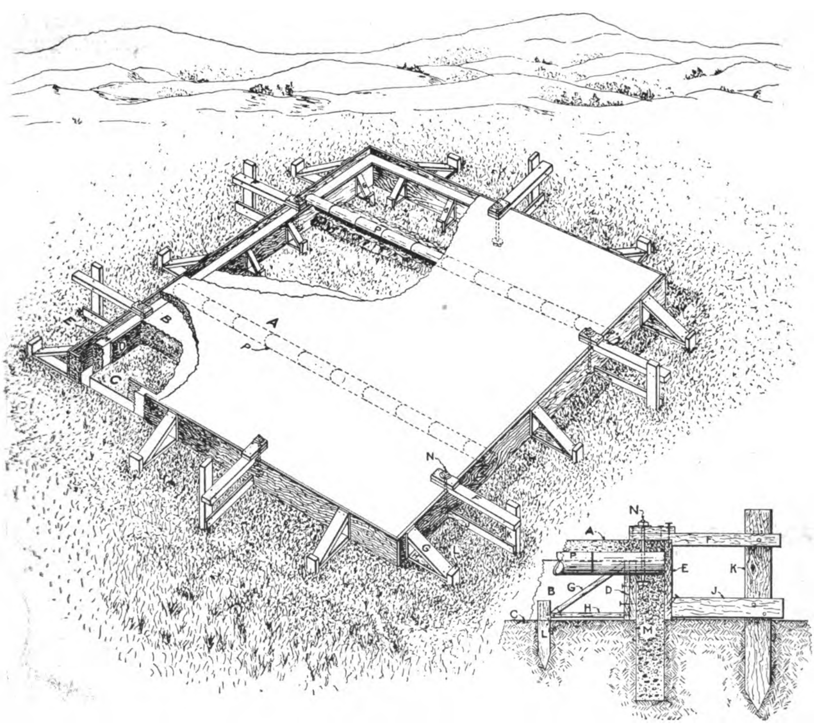


Fig. 3.—This illustrates the method of building the forms for a concrete foundation and floor. Two layers of tile (P) extend through the foundation and under the floor from side to side. That keeps the floor dry. The larger illustration shows a part of the floor and foundation cut away so that each part may be plainly seen. The illustration in the lower right hand corner shows the detail method of construction of the forms for holding the concrete in place.

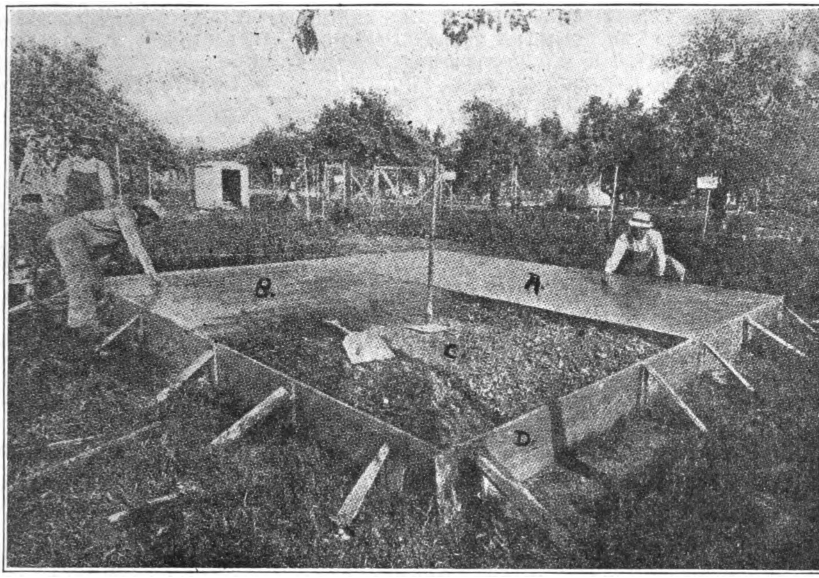


Fig. 4.—D shows the form which has been built to retain the concrete and filler. C shows the cinders and rocks which are used as fillers and for drainage beneath the floor. B is the 3 inches of concrete which forms the body of the floor. This concrete may be leveled down with a 16-ft. straight edge or a 16-ft. 2x4 by dragging it along on the edge of your forms. A. This is the thin finish coat of pure cement and water mixed, and is troweled down perfectly smooth.

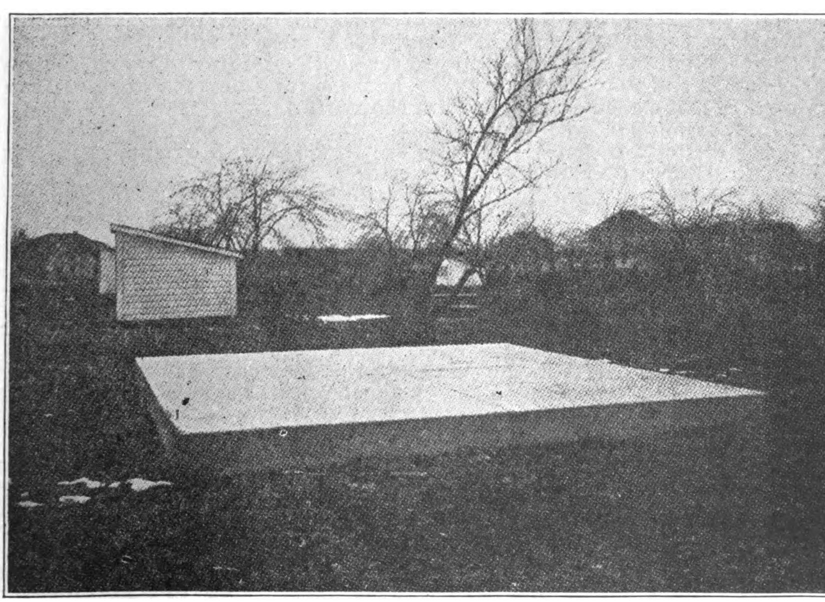


Fig. 5.—A finished concrete floor and foundation ready to receive a fool-proof poultry house 14x14 ft.

THE FRAMING

The sills should be made of 2x4 or 2x6 material. As a general rule, the remainder of the framing material is made of 2x4 lumber. In some sections 2x3 material is in more common use for framing than 2x4. In most sections the most common material for this purpose, however, is 2x4's for studding, plates, rafters and window sills.

THE WALLS

We do not like a high poultry house. Such a house is too cold in winter and unnecessarily expensive. For these reasons, we would make the walls of our house as low as the convenience and the requirements of our hens will permit. This has been found to be six feet in the rear and eight feet in front, or a narrow house could be five feet in rear and seven feet in front. The material should be some kind of cheap matched lumber, such as car siding, drop siding or shiplap. We prefer the matched lumber for the reason that we are not so apt to have objectionable cracks in the house. The walls must keep out rain, snow and cold winds. The walls on the north, east and west should be so built that every opening can be closed and made perfectly tight when desired. Ordinarily, boxing with the cracks battened does not make a desirable wall, because the battens sooner or later become loose and leave cracks which are very undesirable. If you use tongue or grooved lumber and avoid cracks and knot holes in the construction, it is not necessary to have double-boarded walls nor to cover them with roofing paper. We prefer a single wall. Of course, in very cold climates the walls may have to be shingled or the outside covered with composition roofing. Solid concrete walls will sweat, be damp or covered with frost unless ventilating shafts are built in the wall. A double brick wall with an air space between, or a hollow tile wall is very satisfactory.

THE SHAPE AND KIND OF ROOF

Fig. 6 shows four types of roofs commonly found on poultry houses. All except the single span or shed roof in the lower right hand corner have three serious faults. First, the services of a skilled carpenter are required to frame them. Second, they are unnecessarily expensive. Third, they do not admit sufficient sunlight during the winter months. Fourth, in each a portion of the roof slopes toward the south, catching the verticle rays of the sun in summer, and making the house several degrees warmer than it would be if it sloped entirely toward the north.

Fig. 6A shows a semimonitor roof. This is a more expensive roof and more difficult to build. We also are troubled with dampness in this house in the highest portion of the interior.

Fig. 6B is a monitor roof and is still more expensive. It contains too large an air space in the roof to be satisfactory in most climates.

Fig. 6C makes a very good roof, but the long slope is to the south, and you have two sets of rafters.

Fig. 6D is a plain shed roof and is the most satisfactory of all. A 16-foot rafter will reach from front to back in our 14-foot "fool-proof" poultry house. It is easily and economically built. It turns all the water to the north or back of the house, leaving the front dry and warm. In winter months the sun can shine to the rear of the house, as can be seen by the line of the sun's rays, G and E. The shed roof is the most sensible roof which can be used on the average poultry house.

The rafters should be covered with sheeting, boxing or cheap rough boards; shiplap is preferable. Over this we put a layer of good composition roofing paper. This will outlast shingles on such a house and can be more quickly and easily laid. It is also cheaper than shingles. Boards covered with a good grade of composition roofing is all that is needed to make a satisfactory roof.

A roof made of galvanized iron may be economical, but the moisture given off in the breath of the fowls and the heat arising from the body of the fowls will cause moisture to condense on the inside of the roof and this will make the house more or less cold and damp. We have seen such

roofs so damp that water would drip from them and frost would accumulate on the inside in winter months. This condition will bring on more or less trouble with colds and roup. A cheap solid board roof, covered with a good grade of composition roofing, makes the best roof for a poultry house.

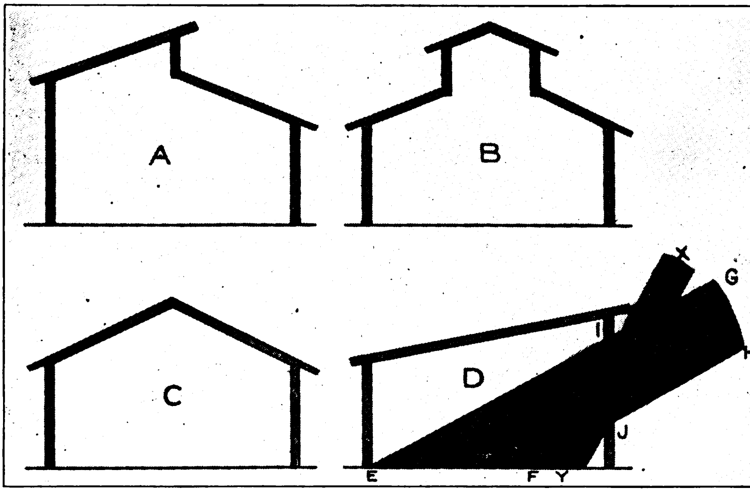


Fig. 6.—Styles of roofs commonly used in poultry house construction. A, semi-monitor roof; B, monitor roof; C, gable roof; D, single span or shed roof. Of these four styles, the shed roof is the most economical and most practical for a poultry house. Chief among its advantages are that it admits a maximum amount of sunshine during the winter months. I J represents a window on the south side; E F represents portion of the floor which the sun will shine on in December, and Y, the portion of the floor which the sun will shine on in May.

WINDOWS AND SUNSHINE

Sunshine is Nature's disease exterminator. You must have light and a reasonable amount of sunshine in your poultry house. Germs and vermin breed in dark, damp houses. Dark corners on the floor of the house make attractive places for the hens to lay. In our 14-foot houses and also in our colony houses, we build two full-sized windows in the front of every section, one window on each side of the ventilator. The windows should always run up and down and not lengthwise of the house. A long, narrow window, running the full length of the house will not admit the sunlight that two windows do when both run up and down. The bottom sash of each of the front windows is made to slide up and down and the top sash is hinged at the top and raises out at the bottom, as shown in Fig. 42. Use about one square foot of glass and window space to every ten square feet of floor space. You will find this about right for the average climate.

Each window sash is independent of the other sash. They can be hinged at the top and open outward at the bottom. They can be arranged in that way or the lower sash to slide up and down and the upper one open outward so that the birds may have the advantage of additional ventilation at times when needed, and at the same time the litter, the fowls and the house are protected from blowing rains and storms.

A properly lighted house adds good cheer and also increases egg production, for it enables the hen to feed for a much longer period before going to roost at evening. With this idea in view, and for the purpose of affording a better system of ventilation during the hot summer months, we place a single window sash in every 14-foot section and below the level of the droppings boards in the rear of the house. This admits light onto the floor and vanishes the dark corners where filth and disease germs and vermin accumulate. This sash is hinged at the top and opens outward, as shown in Fig. 43. In the summer months this is opened, and it makes the house

very cool and comfortable. The hens suffer as much from heat in the summer as they do from cold in winter. The casing is made air-tight and the window is closed in winter months, and the fowls have the advantage of the light, but are protected from drafts. These back window sashes are not used in the 8x12 colony houses. In cold or windy climates, muslin or canvas should be tacked over these rear windows in winter months and be sure to make them air-tight.

VENTILATORS IN FRONT AND REAR

The ventilators in the front of these houses very much resemble the shutters ordinarily seen in the cupolas of barns. They are made of boards six inches in width and one-half to seven-eighths inches in thickness. The length varies according to the size of house you build and according to the size of the opening in the front of the house which is to be filled by this shutter ventilator. For the average climate, we recommend ventilators

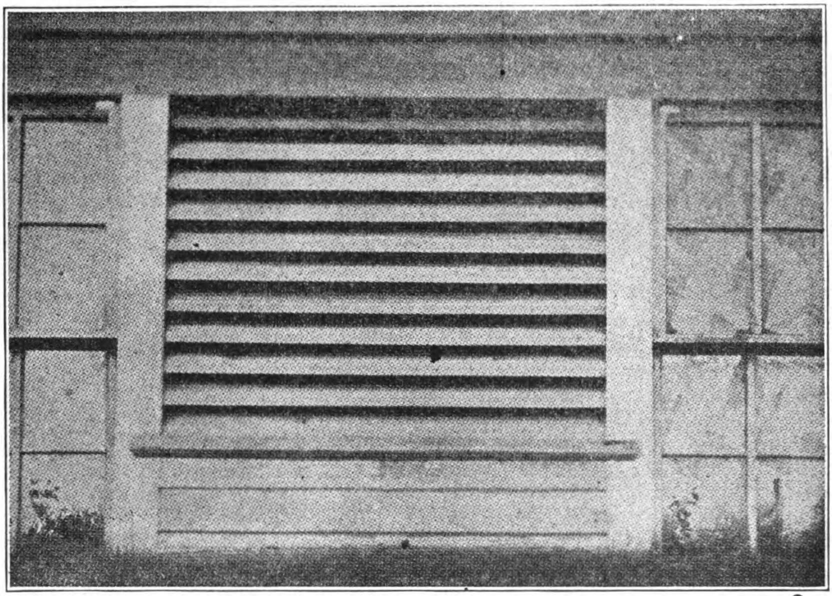


Fig. 7.—This shutter in the front of your house for ventilation and a window on each side of it for light and sunlight is about as near a perfect system as can be constructed. There is about an inch and a half space between each ventilator, and they are placed at an angle of about 45 degrees.

of the following size: About nine-tenths of a square foot of shutter ventilator to every ten square feet of floor space. In warm or mild climates the ventilator space should be increased, the house cheapened and made more open. In extremely cold climates, we recommend tacking muslin or burlap over the interior of the ventilator. This curtain being protected from the weather by the ventilator, will not become wet, and the mesh will not become clogged and filled with dirt, as it otherwise would. It might also be necessary to have a curtain on a pole which can be dropped down just in front of the roosts. In case this curtain is used, it should never reach to the droppings board. The bottom of this curtain should be from six inches to a foot from the droppings board even in the coldest weather. With this ventilator and the precautions recommended there should be no frozen combs or suffering from cold in even very cold climates. The narrow strips of tin or thin lumber which may be tacked on the upper edge of the interior of each ventilator as recommended in lessons three and four will force the air upward and will be an improvement in windy or cold climates.

This shutter ventilator is absolutely fool-proof. It is always in place, it always admits the proper amount of ventilation and at the same time prevents the snow, rain or sleet from blowing in. The dryness of the house is greatly to be desired. It often prevents colds, roup and kindred diseases. Should you have an entirely open front, it is always more or less damp on the floor of your poultry house during the bad weather of the fall, winter and spring months, the very time when the house should be perfectly dry if you expect to avoid diseases. If you have a cloth curtain

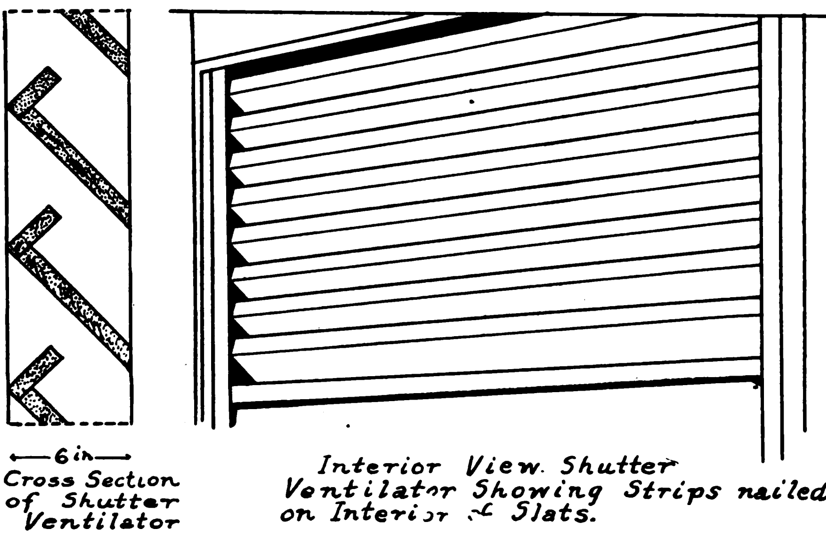


Fig. 8.—Cross section and interior of shutter ventilator. The space between each slat in the ventilator is about an inch and a half. On the interior of each slat of the ventilator is nailed a little strip about the thickness of a lath lattice. The edge of this strip extends about a half inch more above the edge of the ventilator. This forces the current of air upward as the air passes through the ventilator. This prevents a direct draft on the fowls. This leaves a space of about an inch or less between the top of the strip and the next slat in the ventilator. As you go further north and in climates where the wind blows constantly, the ventilators should be placed closer together, and in extreme northern climates a cloth or burlap may be tacked over the interior of the ventilator in winter and removed in summer. By using a little common sense and making slight changes to meet the needs of the climate, this system of ventilation can be used in all locations with equal satisfaction. If our opinion is worth anything, this is one of the best, if not the best, method of ventilation used in any house in any climate. In a warm climate these houses should be built more open and more cheaply constructed.

over the opening and this can be raised and lowered, the curtain is often up when it should be down; is often down when it should be up; is usually torn, off the hinges, or the pores in the cloth have become filled with dirt and dust, so that no air passes through. Neither the entirely open front nor the curtain front is satisfactory. The shutter ventilator solves the problem of proper ventilation.

These ventilators are left open winter and summer. Even in the coldest weather and the temperature below zero, we never think of placing anything over the openings between the shutters, except to tack burlap sacks or curtains over them on the interior. If you are in a cold climate, you should tack a piece of cloth over the ventilators on the interior of the house during the coldest weather. The ventilator will keep the cloth and the interior of the house from becoming damp. After the coldest season has passed, the cloth must be torn from the ventilator. This is necessary in cold climates where poultry is raised. It is not cold we wish to avoid entirely, but it is storms, dampness and drafts which we ought to avoid in housing poultry. Fowls prefer out-of-door life. Before they were domesticated, chickens roosted in trees and housing is really an artificial condition for them.

Little strips of tin or thin lumber are nailed on the interior and upper edge of the interior of each ventilator to force the air upward as it enters the poultry house. We really think this an improvement over the plain ventilator, especially so in a windy or cold climate.

It is a serious mistake to try to heat poultry houses for laying and breeding stock. We must not entirely overlook the nature of the hen and compel her to live under too artificial conditions. We should make her comfortable and protect her from the storm. The objects we should have in mind are the health of the fowls and increased productiveness. The comfortable, happy hen is the profitable hen.

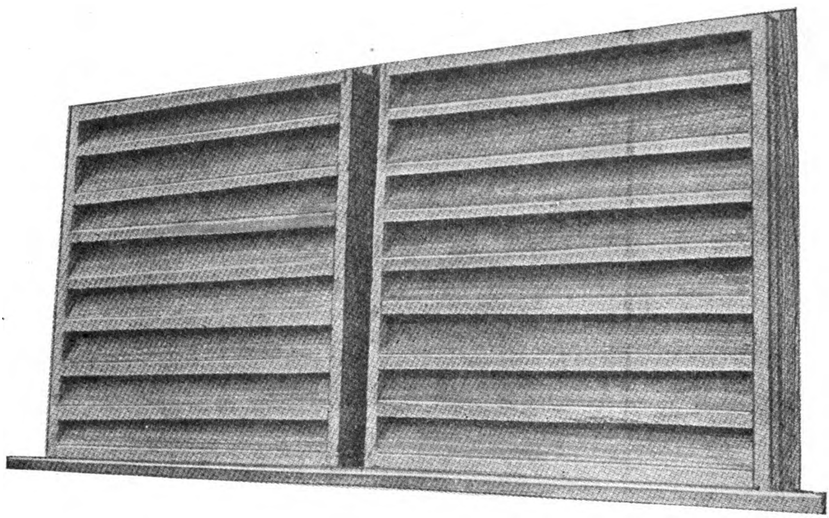


Fig. 9.—An opening is left in the front of the house. A ventilator is made large enough to just fill this opening and is then nailed in place.

If you construct a Quisenberry "Fool-Proof" Poultry House and use these shutters, you do not need worry about dampness or ventilation, roup or colds, providing other conditions are right. You will find that the fowls are stronger and hardier, and the eggs will have stronger germs and be more fertile when the fowls are so housed. You do not need worry about severe dry cold weather being detrimental to your fowls in the interior of this house. The physicians all recommend pure, fresh air as the best treatment for many diseases among the human family. The prevention and cure of many diseases among poultry is also pure fresh air. This shutter ventilator is fool-proof and is going to prove a blessing to the poultry fraternity and saves the labor of caring for curtains, etc.

In addition to this shutter ventilator in front, we have a six-inch ventilator about eight feet long just under the eaves of the house on the rear side. (Fig. No. 69.) This is opened in the hot months and aids in keeping the ceiling of the house cool and adds greatly to the comfort of the hens. These ventilators in front and the window sash and ventilator in the rear are the things which make the Quisenberry "Fool-Proof" Poultry House far superior to any other style of house which you might build. With this system you can have just as much or just as little ventilation as you desire. The house is always dry. It is cool in summer and comfortable in winter, and being free from dampness and properly ventilated the combs of the fowls gradually become hardened to the cold and do not freeze so easily and quickly as in most other styles of houses. If you build the house as we recommend it, and do not try to incorporate some new ideas of your own, which have not been tried out, you are certain to be more than pleased with the results.

TO INSURE ABSOLUTE DRYNESS AND PERFECT HEALTH

It is vitally essential that the litter, walls and entire house be absolutely dry to insure perfect health and high egg production. The Improved Shutter Ventilator and a board ventilator placed within six inches of the eaves in the rear of the house, insures as near perfect ventilation and dryness as it is possible to get in the average climate. In some sections, climatic and weather conditions are such that an additional ventilator is needed in order to keep the litter and walls perfectly dry. For that reason we herewith illustrate a system of ventilation which will dry out and keep dry such houses as are inclined to dampness, colds and roup among the fowls. We have tried it out and seen it tried in some of the worst climates and under the most unfavorable conditions. It will easily pay the cost in reduced mortality and in increased egg production.

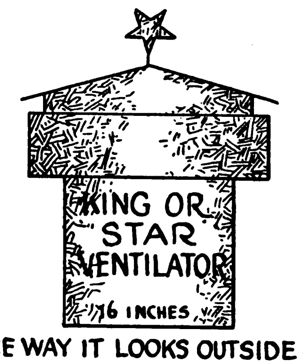


Fig. 10.

Fig. 10. A King or Star ventilator cap can be used for the opening on the exterior of the roof. For a house or section of a house 12 feet square, use a ventilator cap 12 inches in diameter. For a house 14 feet square use a 14-inch ventilator. For one 16 feet square use a 16-inch ventilator. For a house 20 feet square use a ventilator 20 inches in diameter.

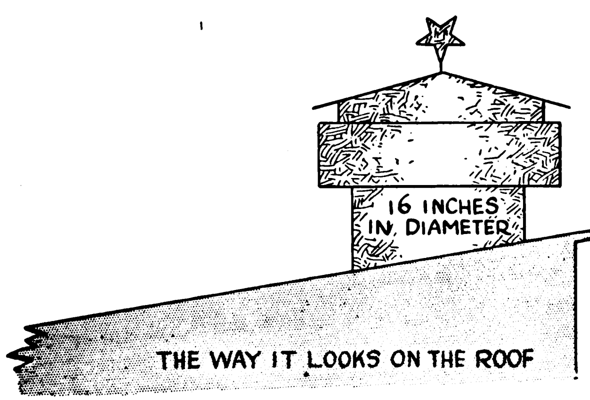


Fig. 11.

Fig. 11. These galvanized iron ventilator caps should be placed within six inches of the front wall of the house, and in the corner to one side of the room within two feet of the partition or end walls of the house or room. If this outlet or roof ventilator is placed near one end of the room, the floor ventilator or intake shown in Figures 13, 14 and 15 should be placed in the opposite end.

Fig. 12. This shows a cross section of the galvanized ventilator cap and shows how the air circulates up and out, or as the ventilator appears if you look up through it from the interior of the house. You will note a damper on the interior of the ventilator cap. These should be placed in every cap. In a 16-inch ventilator you use a 16-inch damper with an eight-inch hole in the center of the damper. If the temperature goes several degrees below freezing, the damper is closed, but the eight-inch hole in the center remains open at all times to insure a circulation of air in the house without drafts.

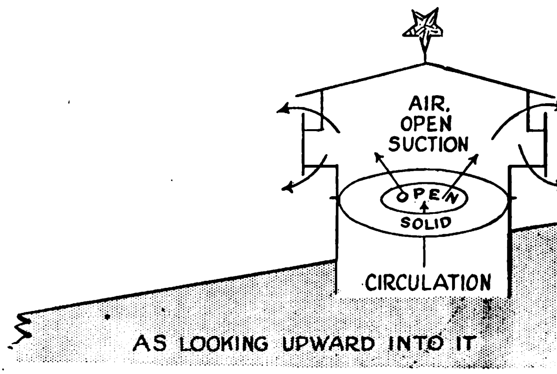
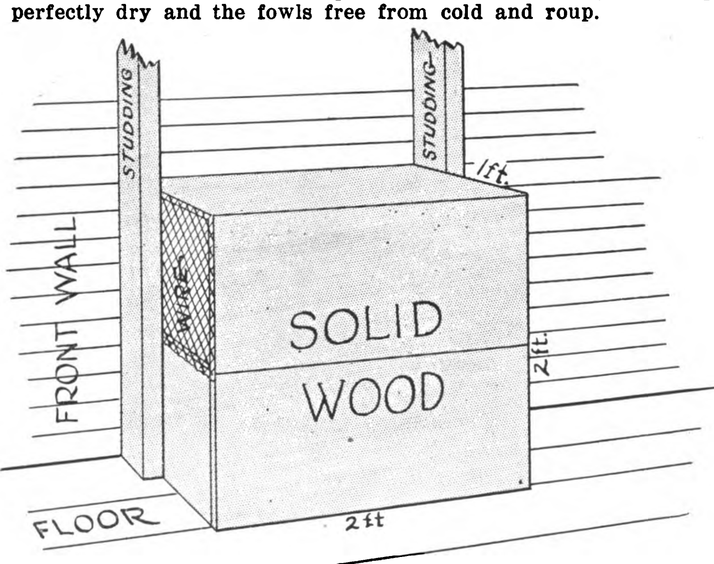


Fig. 12.

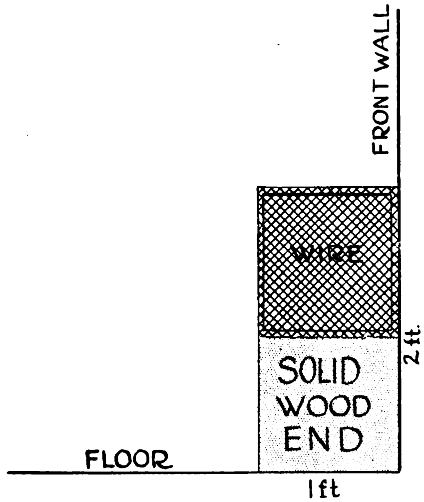
In moderate weather, the damper is kept on edge so that the ventilator cap is open full width. The damper should have a hole in the center which is one-half of the diameter of the damper. In other words, a 12-inch damper has a six-inch opening in the center, a 14-inch damper has a seven-inch opening; a 16-inch damper has an eight-inch hole, and a 20-inch damper has a 10-inch opening in the center. These ventilator caps and dampers can be purchased from most any hardware merchant, builder or tin-smith. The opening in the center of the damper prevents the damper from being so tightly closed that it completely cuts off all circulation. This creates a suction which takes all foul air and impurities from the house, also keeps the house perfectly dry and the fowls free from cold and roup.



VENTILATOR FROM REAR

Fig. 13.

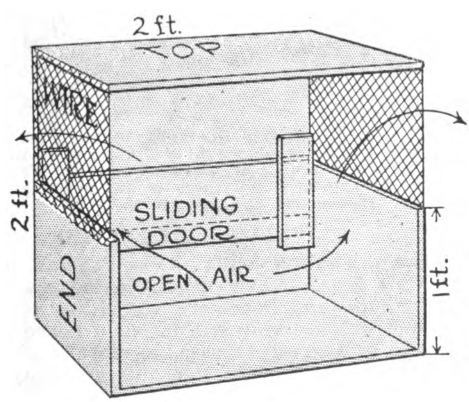
Fig. 13. This illustrates the outside of the floor ventilator or air intake as it appears on the interior of the house. These should be placed within two feet of the partition wall or end of the house and in the opposite end from the roof ventilator cap or outlet. These are built against the front wall and between the studding. These floor ventilators are two feet high, about two feet long or the distance between the studding, and are a foot deep or wide. The top and front are built solid as shown. Each end is boarded up one foot from the floor, but at the top one foot is covered with poultry netting, leaving an opening one foot square at the top at each end of the ventilator. This permits the air to circulate without a direct draft on any fowl standing near.



FROM END

Fig. 14.

Fig. 14. This shows an end view of the floor ventilator, built against the front wall. It is a foot wide, and two feet high. A solid board, one foot square, is used at the bottom, and poultry netting or wire, one foot square, is used at the top.



INTERIOR
AS SHOWN WITH BACK TAKEN OFF

Fig. 15.

Fig. 15. This shows the front of the floor ventilator on the interior of the house with the boards removed so that you may look into it and see the sliding door which works up and down over the opening in the front wall of the house. This opening is made 10 inches high and the full width of the ventilator. Even in the coldest weather this sliding door is left open, one or two inches from the bottom, seldom ever less than two inches. In moderate weather it is opened wider, and in summer is kept entirely open. With this floor ventilator partly open and the opening in the center of the damper in the roof ventilator, there is always a perfect circulation of air, which can be increased or decreased according to climatic or weather conditions. The ventilation, the dryness of the litter, and the health of the birds are absolutely under the control of the poultryman. This sliding door in the floor intake should slide up and down in cleats at each end of the door. This door can be opened anywhere from one to ten inches. This permits the air to come in at the bottom, it strikes the solid sides and then rises and presses upward through the wire netting. This provides an abundance of oxygen in the house, and the dead air and impurities are sucked or drawn on out through the roof ventilating cap. If you are troubled with dark litter, colds or roup, we recommend this addition to your ventilating system in any poultry house.

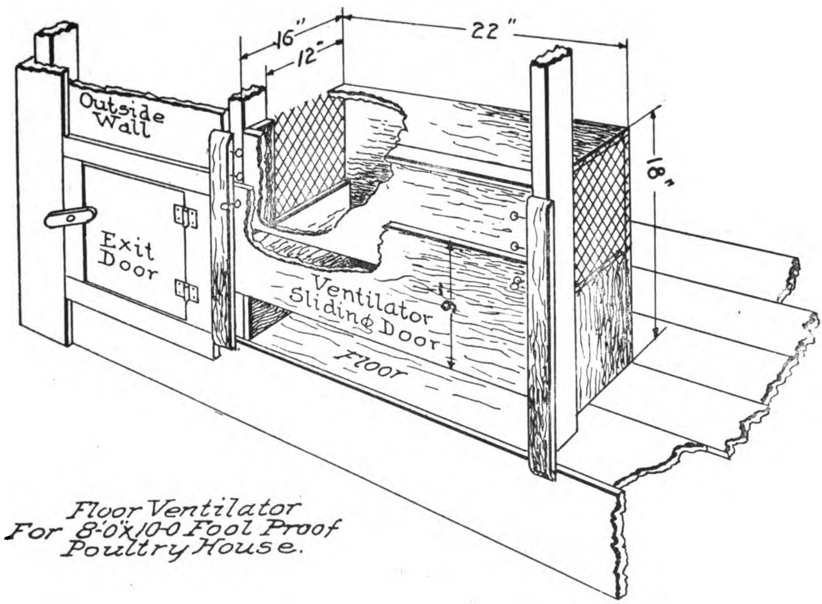


Fig. 16.—While this size ventilator fits an 8x10-foot Fool-roof House exactly, yet the details of the floor ventilator shown above, applies to any house, only in larger houses the dimensions of the ventilator must be larger. We recommend this system and must be used in all houses where there is any tendency to dampness or damp bitter, or to colds, roup, chicken pox or canker in the flock.

CAUSE OF WET LITTER

When the temperature in a poultry house is below 80 degrees, carbon-dioxide is found near the floor. When carbon-dioxide gas is mixed with oxygen it turns to water or moisture, hence the wet litter we too often find in our poultry houses. The presence of wet litter in a house is an indication that carbon-dioxide exists to a great degree, therefore, the house must be ventilated near the floor so this can be taken out and away from the house and fowls.

TESTING THE VENTILATION

The proof of the system of ventilation and as to how the air moves about in a house can be tested by the use of a smoke smudge or bee-smoker. Go

into a poultry house and create some smoke and you can tell from the direction in which the smoke moves and the way it leaves the house as to whether you are getting correct circulation of air or not. The test of the ventilating system in any house can be told by the length of time the straw or litter lasts without becoming damp. Poultrymen should keep ahead of the foul air and wet litter by ventilating, as you are in a danger zone when either appears and when the fact is discovered it means to "get busy" or else it will not be but a fey days until Canker, Chicken Pox, Colds and Roup will develop.

Carbon-dioxide is heavier than air and always sinks to the lowest level, especially when the temperature is below 80. For this reason it tends to accumulate in deep caves, wells and the floors of poultry houses, forms what is known as the "after damp" of abandoned coal mines, caves and wells which often causes death to human beings when they enter such places unknowingly.

Pure Carbon-dioxide or air very heavily charged with it is almost instantly mortal to animal life. A single full breath of it may produce immediate asphyxiation. It extinguishes life by oxidation. Our life process is a slow combustion of burning, and Carbon-dioxide puts it out as it extinguishes the fire. Chemical fire extinguishers containing water heavily charged with this gas aids the water to smother the fire. A large quantity of this gas in poultry houses causes the litter to be damp and is responsible in the majority of cases for Colds, Roup, Chicken Pox, Canker and all kindred diseases.

BUILD CHEAPER IN MILD CLIMATE

In California, Florida and mild climates a plain shed roof, open-front house can be built. It should be constructed from as light and cheap material as possible. In such climates about all that is needed is a roosting place, protection from sun or storms, and a place to eat and lay. In extremely cold climates the houses should be built even closer than the Fool-Proof and it may be necessary to cover the outside walls with composition roofing material. Use good judgment. Houses for mild climates are illustrated in Lessons three and four.

FLOOR SPACE PER BIRD

We allow not less than four square feet of floor space per bird for hens intended for breeding purposes. In this case it is fertile, hatchable eggs and livable chicks which are desired. Therefore breeding stock should have all the room you can give them—four to eight square feet of floor space per bird.

In the case of laying hens, you can confine them to three to three and one-half square feet of floor space if you desire to do so. In this case you want large quantities of eggs and you do not care so much about the fertility. The layers are given just enough exercise to keep them in good health, therefore can be kept under more crowded conditions.

QUESTIONS ON POULTRY HOUSE CONSTRUCTION

Lesson No. 1

1. What are five of the most common faults to be found with the average poultry house, and what are the best features you find in the Fool-Proof Poultry House?

2. Describe what you would consider a good location for a poultry house. Discuss what you consider a bad location.

3. Why is it desirable to build each section of the house as nearly square as possible?

4. How many square feet of floor space should be allowed per hen in a breeding house? In a laying house? Why the difference?

5. What kind of a foundation do you consider best for your poultry house, and what kind of floors are in general use? Which is best?

6. Why should a concrete floor be made in the spring or summer?

7. What do you consider the best kind of material to use for siding? Why?

8. Describe the different shapes of roofs. Which shape do you consider best? What are your objections to other shapes? Which is the best roofing material?

9. How many square feet of glass should there be to each ten square feet of floor space, and how many square feet of shutter ventilator for each ten square feet of floor space?

10. What advantages has the shutter ventilator over other systems of ventilation? What other provision should be made for ventilation besides the shutter ventilator?

Lesson No. 2

POULTRY HOUSE CONSTRUCTION—THE QUISENBERRY FOOL-PROOF POULTRY HOUSE

THE DOORS

In the breeding house or laying house it is advisable to have doors in both ends. If you have a partition in a long breeding house separating different pens, it is also advisable to have light doors on swinging or double acting hinges, so the attendant may pass through from pen to pen without having to stop to fasten doors and latches. In the colony houses you may

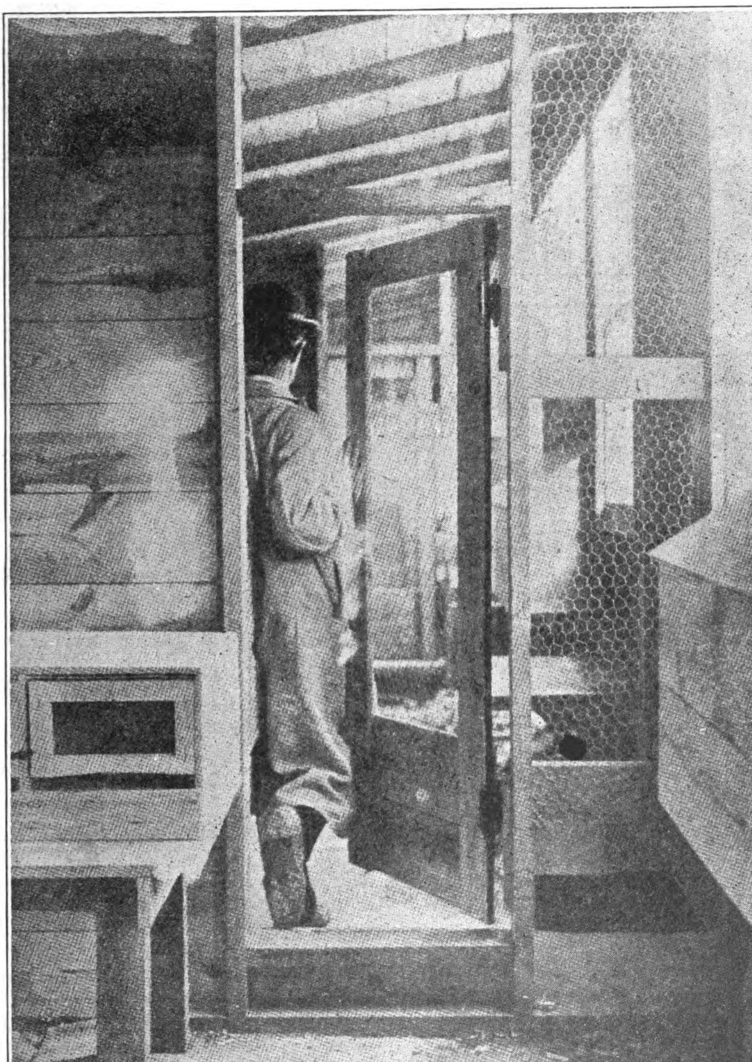
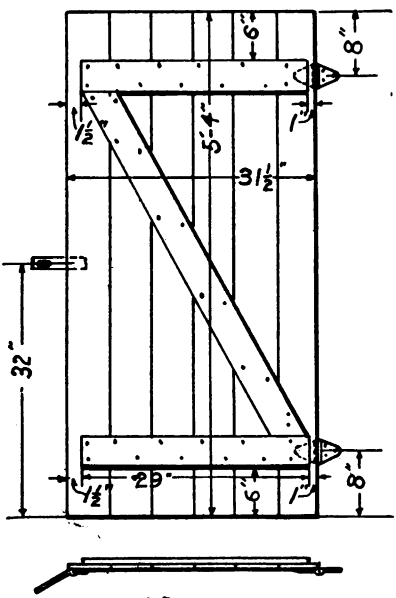


Fig. 17.—If you will hang all partition doors on swinging or double acting hinges it will save much time and labor in opening and closing numerous doors and gates.

have only one door in the end, and prefer that in the east. All doors should be made wide enough to permit the attendant to enter conveniently with pails or baskets in each hand. If outside doors are to remain open in summer months, always arrange for some method of fastening the door open. Do not allow it to swing loose and be broken from the hinges.



Outside Door
For 8'0"x10'0" Fool Proof
Poultry House.

Fig. 18. This shows the construction and dimensions of the outside door of our 8x10 house. This is an interior view. We usually hinge all outside doors with the hinges toward the back of the house and the front edge of the door toward the front of the house. The outside doors are made to swing outward and toward the back of the house. All inside doors are hung so as to fit the plan of construction and the convenience of the poultryman himself.

ROOSTS AND BROODY COOPS

The roosts in these houses are always located in the rear of the house. We use 1x2 material for roost poles and round the top edges a trifle. We place the narrow edge of the 1x2 upward. These are nailed to 2x6's, which rest on the droppings platform. The rear roost is about twelve inches from the rear wall, and the roost poles are about fourteen inches apart. They are always built on a level, and never on a slant. Where one roost is higher than another, the hens will try for the top roost. They crowd this roost and cause one another to fall off and often bruise or injure themselves. The top roost is also several degrees warmer than the lower roost. This is a very common error. Six to ten inches of roosting space should be allowed to each bird, depending upon the breed. The roosts can be raised and fastened to the roof, as shown in Fig. 23, and the droppings easily cleaned from the platform. The roost poles need not be more than six or eight inches above the droppings board.

A test of roosts of different sizes was made and this is what was found:

Roosts and Sore Footed Hens: In many flocks as high as 50 per cent of the hens have one or more corns on the bottoms of their feet.

The average poultryman pays little attention to this till the foot swells to such an extent that it is called Bumble Foot, and the cause usually given is that the hens jump off the roosts onto a hard floor, etc.

A closer study of this trouble reveals the fact that it is usually a corn in the same sense that people have corns on their feet and caused in the same manner, viz.: Unnatural friction or pressure.

The next question is, where and how does this occur? This question is answered by studying the size and shape of the hen's feet and roosts.

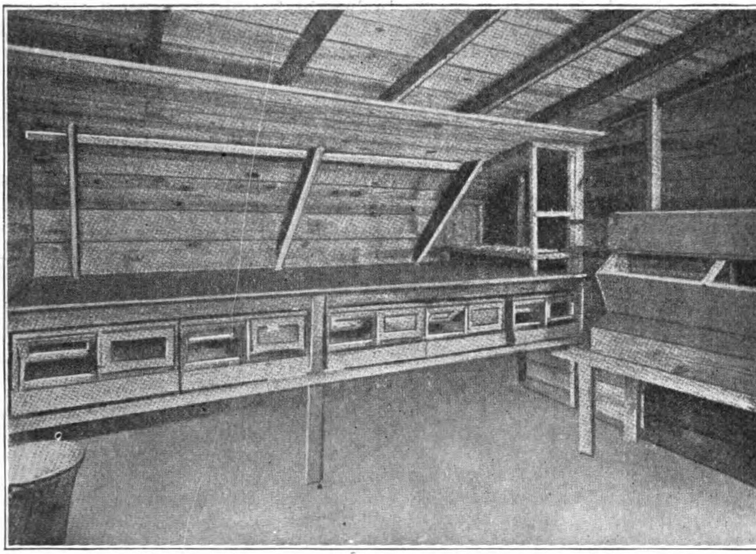


Fig. 19.—The roost poles should be made of 1x2 material with the top edges rounded. These should always be on the level and be six or eight inches higher than the droppings boards. Never place the roosts on a slant, one above the other.

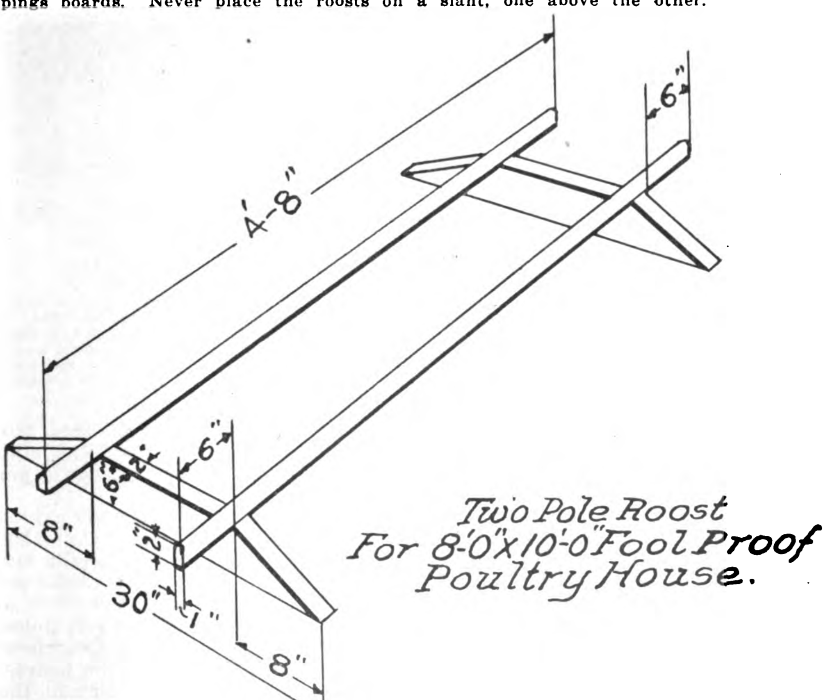


Fig. 20.—All roost poles are made of 1x2-inch material, with the narrow edge rounded so there are no sharp corners, the narrow way of the pole always being turned upward. Supports of 2x6-inch material are used as supports for the roosts. These supports are sawed off at an angle as shown in the illustration so the poles cannot be shoved back too close to the wall for comfort or welfare of the fowls.

The Leghorn's foot averages 3½ inches in length from end of back toe to end of middle toe, the back toe and bottom of foot equal about the length of the middle toe, so that the center of gravity is just in front of the bottom of the foot.

It is natural for the hen to clasp her toes over the edge of the roost. Now if the roost is more than an inch wide the hen will clasp her toes over the front edge which causes the bottom of her foot to rest on the roost and usually the skin in the bottom of her foot is wrinkled, which produces a corn. Roosts which are only an inch wide permit the toes to reach over, yet let the bottoms of the feet remain free while the center of gravity is in a perpendicular line with the roost.

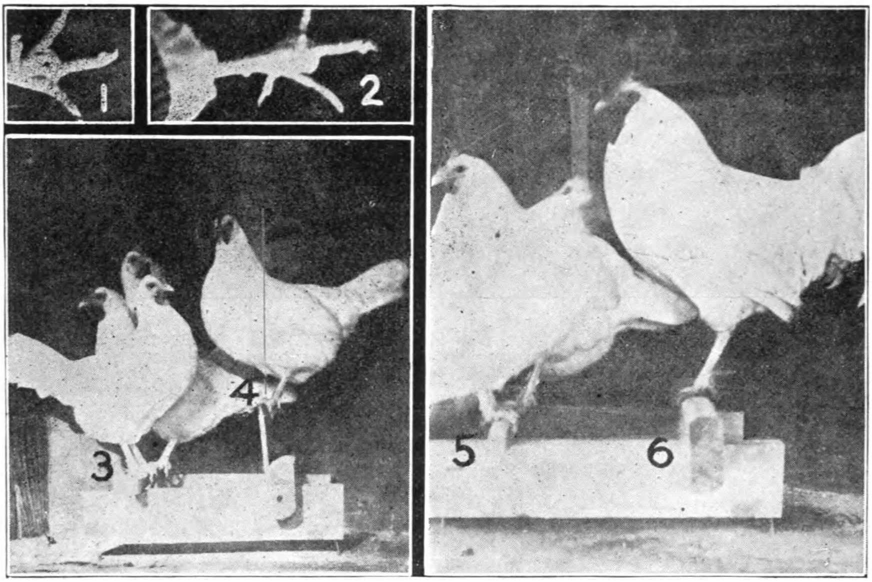


Figure 21.

ILLUSTRATION SHOWING CORNS AND CAUSES OF CORNS

No. 1. The bottom of a hen's foot, showing corns. No. 2. Shows top of same foot, showing swelled conditions. No. 3. Hen on 1x2 inch roost, showing position of bottoms of feet. No. 4. A hen standing on edge of thin board (one-eighth inch thick) to show the center of gravity. No. 5. Hens standing on 1x2-inch roosts, same as in No. 3, showing positions of bottoms of feet. No. 6. Male standing on a 2x4-inch roost with top edge rounded, showing position of bottoms of feet on wide roosts which produce corns.

Roosts made of 2x4-inch turned up on edge with the tops rounded pro duce corns in about 50 per cent of the hens while 1x2-inch or blind stop material turned on edge with the edges rounded produces only 3 or 4 per cent corns.

On the underneath side of every section of the roost there should be tacked poultry netting. If your roost poles are not so constructed that wire can be tacked on them, you should build a special frame of light material and cover this with poultry netting. This wire should be about six or eight inches above the droppings board. The purpose of this wire is to keep the fowls out of the droppings when they are off of the roost poles. The droppings fall through the wire onto the boards and they remain there undisturbed and soon dry out. They are not smeared over the boards, which makes them hard to clean. The birds do not get their feet in the droppings and then soil the eggs. In case intestinal worms or other objectionable things are passed by the birds which might be a means of spreading disease, the droppings are protected and kept away from the birds. This little device means better sanitation and cleanliness.

On the same level of the roosts and at one end of the house you should construct a small wire broody coop with slatted bottom, in which to confine broody hens while breaking them from sitting. (Fig. 22.) This is built from the wall, so that it may be removed and easily cleaned, or not used during seasons when hens are not broody. You can arrange to water and feed hens in the coop, and you will find it a great convenience in your poultry house.

If there is a good shade tree in the poultry yard, a broody coop can be built as is described in the lesson on Equipment, etc. This will give the hens more fresh air and give more room in the house.

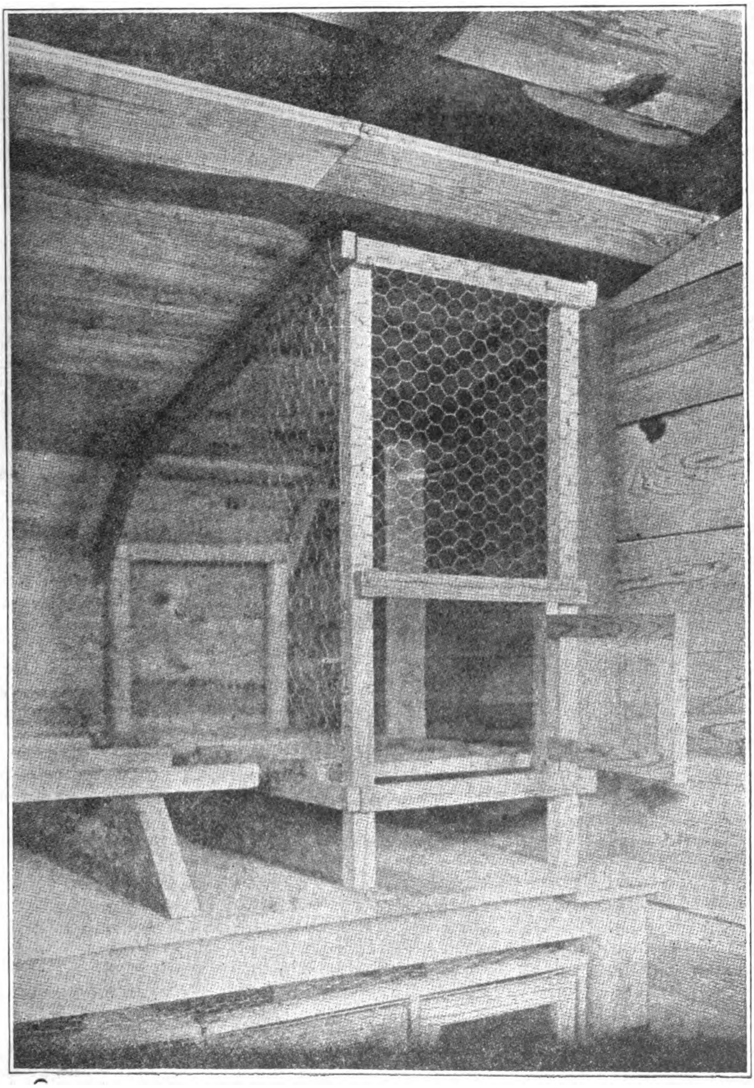


Fig. 22.—The jail or calaboose. Here broody hens are confined for four days. They are well watered and fed while in this coop, and this is a good device for breaking hens from sitting.

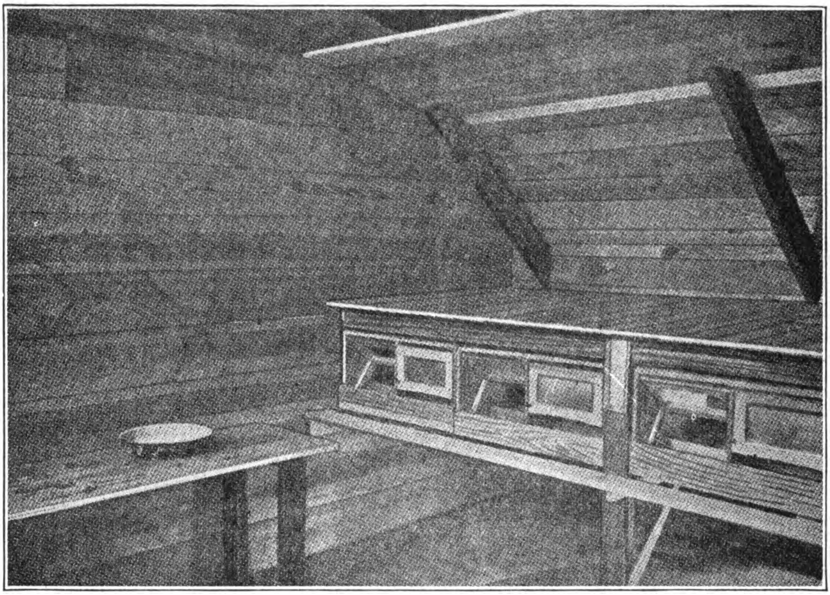


Fig. 23.—The roost raised and fastened with a screw hook and eye to the ceiling above. This permits the droppings boards to be easily cleaned.

DROPPINGS PLATFORM AND CEILING

Sanitation is a very desirable thing in any poultry house, and it is impossible to feed your poultry under sanitary conditions if they are forced to scratch in litter and eat feed mixed with their own droppings. For this reason we think it is advisable to construct a perfectly tight droppings platform under the roosts. (Fig. 25.) If the back wall of the house is six feet high, we place the droppings platform three feet and six inches from the floor. The roosts are six inches above that. This platform preserves the droppings, which are a valuable fretilizer, and it makes frequent cleaning a simple matter. With this system you may place your nests underneath (Fig. 19), and thus use this valuable space for that purpose, and it leaves the wall space free for the use of bins, feed hoppers, drinking pans and other desirable equipment. We make the droppings platform out of thin or light material, and place the edges so they fit perfectly or else use tongue and grooved lumber, so that they are free from cracks. In a 14-foot house we built the droppings platform in three sections, so it can be easily removed. (Fig. 25.) We nail a cleat to the rear wall and use a 2x4 across the front of the droppings platform for the front and rear to rest on. The 2x4 drops into a groove made for it at each side of the house, so it can be removed.

Without a droppings platform our system of ventilation would not be complete. You could not safely have the window sash in the rear of the house below the droppings platform, neither could you have the ventilator under the eaves, for your fowls would be roosting in a draft. These are both absolutely necessary for best results. To avoid drafts where we use the ventilator and the window in the rear of the house. remember that the droppings board protects the fowls from the drafts from the window, and the back wall is ceiled and the rafters are also ceiled overhead to a point even with the front edge of the droppings board. (Fig. 25.) Six-inch flooring is used for this purpose. If ceiling boards or flooring are used we recommend nailing them with the groove upward so that it forms a trough to hold liquids used for exterminating mites. Or you may use a cheap plaster board such as is used as a substitute for plastering. The

plaster board really makes the roosting quarter warmer. This enables you to have all the ventilators and windows open in summer and the house is filled with fresh air, but no draft ever reaches the fowls.

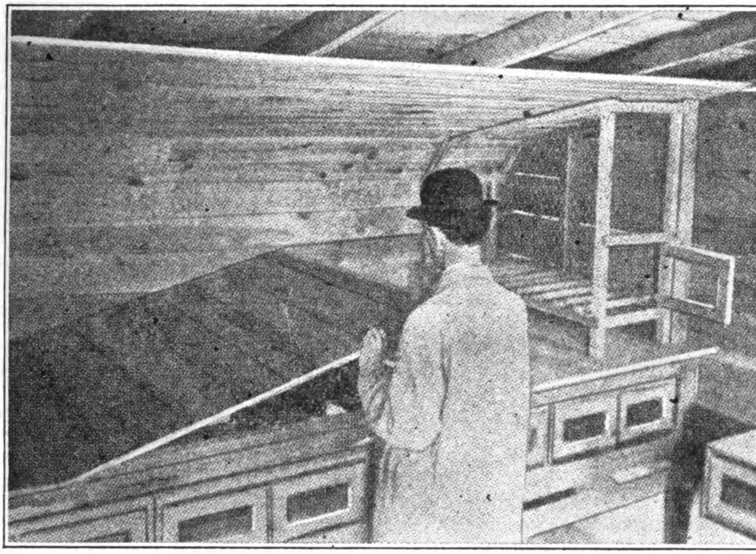


Fig. 24.—All poultry houses of any size, where fowls are kept in them for any length of time should be provided with roost platforms or droppings boards. These should be built in sections as shown. They can then be easily removed for spraying, cleaning and disinfecting. Also if you wish to brood chickens in such houses, the droppings boards can be removed and later be replaced.

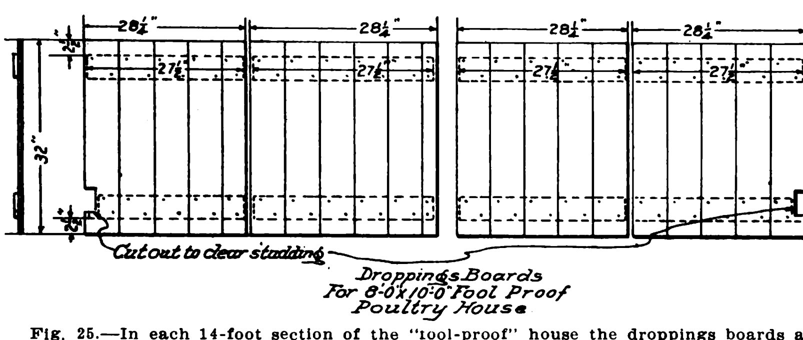


Fig. 25.—In each 14-foot section of the "fool-proof" house the droppings boards are built in three sections so they can be easily handled by one man. This enables them to be removed and thoroughly cleaned and disinfected. Never nail the roosts, nests, droppings boards or any of the fixtures to the wall. It is important to have these free so they can be removed and the house thoroughly cleaned.

ARRANGEMENTS OF NESTS

The hens prefer to lay in some secluded spot. Do not put the nest down on the floor or out where it is too light. The hens see the soft shelled eggs and the broken eggs, and they often develop the habit of egg eating. The nests should be simple and constructed so they may be easily removed.

In the accompanying illustration, Figs. A and B are considered the best. Figure C is too complicated and expensive. Figure D the nests occupy valuable floor space. Figure E does not provide for nests. Figure F is the most undesirable of all because one roost is higher than another and no droppings board has been provided. Figure G is a wall arrangement for trap-nests when they cannot be provided for underneath the drop-

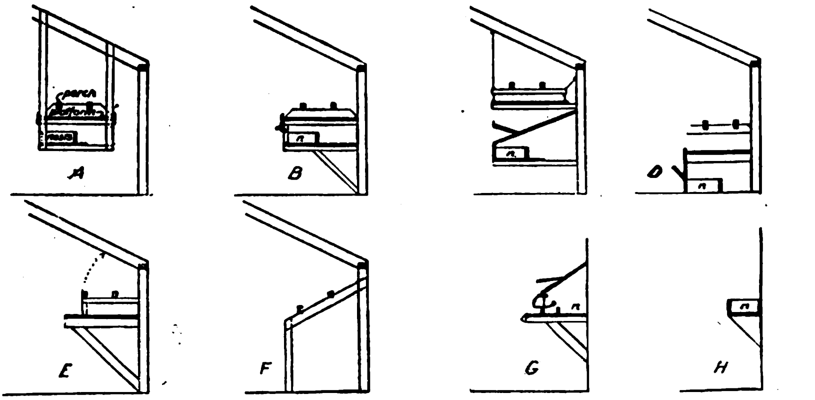


Fig. 26.

pings board. Figure H is an open wall nest, but is not desirable because the fowls roost on it and it is not secluded enough.

We prefer to place the nests under the droppings platform. This is a convenient place, and the nests do not occupy any of the valuable floor or wall space. The next best place for nests is on the side walls. Each nest should be not less than twelve inches wide and fourteen inches deep, and twelve to fifteen inches high. A convenient arrangement of nests is shown in Figs. 19 and 23.

CONVENIENT HOME-MADE NESTS

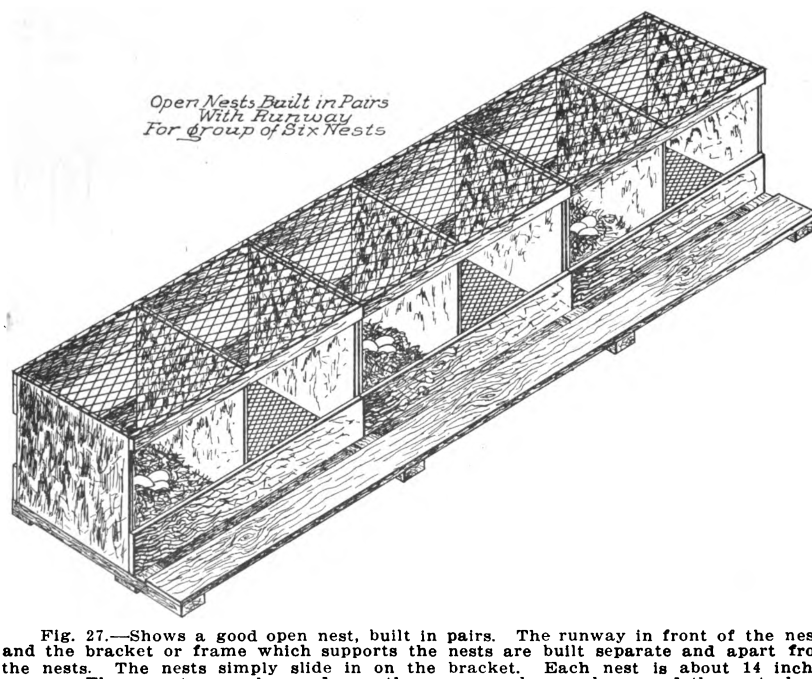


Fig. 27.—Shows a good open nest, built in pairs. The runway in front of the nests and the bracket or frame which supports the nests are built separate and apart from the nests. The nests simply slide in on the bracket. Each nest is about 14 inches square. These nests can be made so the runway shown above and the nest shown above will face the back wall. The hens can then enter from the rear. In that case you can leave a six-inch opening in the other side of the nest and tack a cloth over it to protect the hens from the light. The cloth should be tacked at the top only, and raised when gathering eggs.

You should have about one open nest to every four hens. The nest should be deep enough to prevent the eggs from rolling out, and should be up off of the floor to prevent the hens from eating the cracked and soft shelled eggs. We build these nests in units of two. When they are built in pairs, they are easily handled by any lady or by the children. We use a wire bottom in these nests made of what is known as "hardware cloth." By using wire bottoms it makes the nests much lighter and also does not give mites, parasites or bacteria any place to hide. The straw can be removed from the nest and the nest held over a flame and every living thing killed without injuring the nest. We also use tops made of one-inch mesh poultry netting. You can use light boards on top if desired, or if your nests are to be placed along the wall you can put a slanting steep top on the nest so the hens will have no place to stand or roost. We build the nests about fourteen inches square, and this gives room for ten nests under the droppings board in a 14-foot house. Keep the nests clean and remove the nesting material quite often.

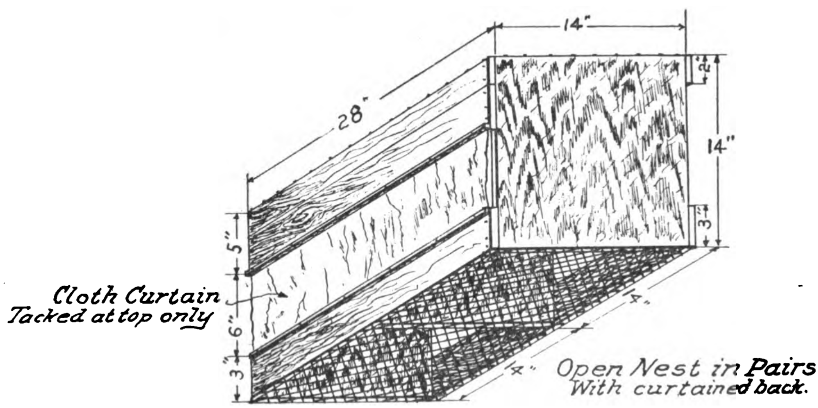


Fig. 28.

You can use either wire or wooden tops on the nests. Use solid partitions every 14 inches. The wire bottom gives no place for mites to hide and makes the nests more sanitary.

A TRAP-NEST

During the breeding season or during the fall and winter months it is often desirable to trap-nest the breeding stock. This is the only way any breeder can make any real progress in building up a great strain of fowls of any variety. For that reason we herewith give you plans for one of the best trap-nests we have ever used. It can be easily made at home.

HOME-MADE TRAP-NEST

There are many kinds of home-made trap-nests, but none have proven so satisfactory with us as has this nest. The nests are of good size, 12x18 inches inside measure and twelve to fifteen inches high. A board three inches high is put across the nest twelve inches from the back, which makes a nest twelve inches square, and this board holds the nesting material in place. The most convenient unit is two nests. The nests should be built in pairs. This makes a nest in which a good large hen can be comfortable either sitting or standing, which is a desirable quality in a trap-nest. This door and trigger can be used on any sort of nest or box you care to attach them to.

The body of the nest is built of light material, one-half or five-eighths inch lumber. The trigger and front door should be made of seven-eighths or inch material. Nests which are to be placed under tight droppings platform or underneath any object which will prevent the fowls from roosting on them need be covered only with one-inch mesh poultry netting. Otherwise make the top of the nest tight. It is a good idea to leave an inch

opening in the back or sides of the nests for ventilation. Also leave an opening of one-fourth of an inch in the back of the nest at the bottom. This prevents the eggs or the nesting material from passing through this opening, but at the same time gives you a space through which to scrape the trash and fifth which accumulates in the bottom of any nest.

Use a door consisting of frame over which small mesh wire has been tacked. We like the wire door better than a solid wooden door, because of the fact that it affords ample ventilation, the lack of which is one of the glaring faults of the average trap-nest.

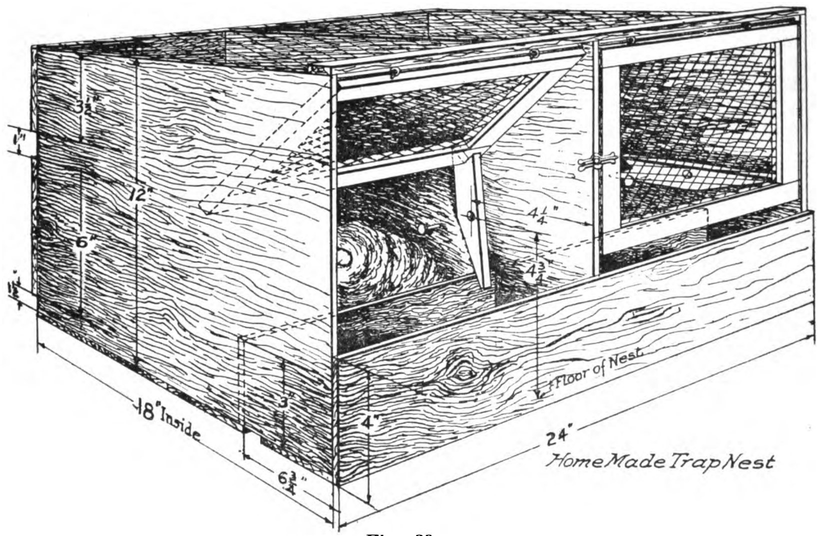


Fig. 29.
This shows one side of the nest open to receive the hen and the other side closed. Notice the thumb button on the front of the nest for the door to shut against. The inside measurements of each nest are twelve inches high, twelve inches wide and eighteen inches deep.

The door is hung on screw eyes. The screw eyes are placed in the upper corners of the door. A gimlet or a small bit is used to make a small hole through each partition at the top of the nest where the door is to be hung. A long wire is passed through these holes and also through the screw hooks at the top of each door and the wire is then bent and fastened at each side of the nest. This one wire allows the screw hooks and the door to swing on it. This acts as a hinge for the doors and allows them to swing freely back and forth. The door must swing absolutely free if the nest is to be a success. This makes a cheap hinge and permits the door to swing freely in all directions.

The door is checked by means of screw hooks or thumb buttons. These screw hooks are made by bending down ordinary hooks of the proper size and for purposes of this kind. The buttons are placed on the front of the center partition and act as a stop for both doors. If you should be troubled with the buttons working loose, then use the screw hooks.

The trigger can be attached to the side of the nest box by using a long screw, but in every case must work freely. The screw must be set squarely into the side of the box to absolutely prevent the trigger from binding against the side. Free action of the trigger is positively required.

The trigger must be set in such a position that when the door is swung inward and rests on the notch it will be invitingly open and at the same time this opening must be small enough to prevent the hen walking into the nest without touching the door with her back. As she steps into the nest and slightly raises the door, the trigger is released and falls backward. The door then swings down and the pointed end of the trigger rises behind it, effectually locking it.

See that the nesting material does not interfere with the trigger. Long hay or straw may eventually get piled up in such a manner as to interfere with its action. To remove the hen, simply turn the button or screw hook and swing the door outward, or, if you prefer, turn down the point of the trigger and swing the door in toward the top of the nest, thus permitting the bird to come out that way. Of course the nest can be set in a partition with a back door through which the hen may be removed.

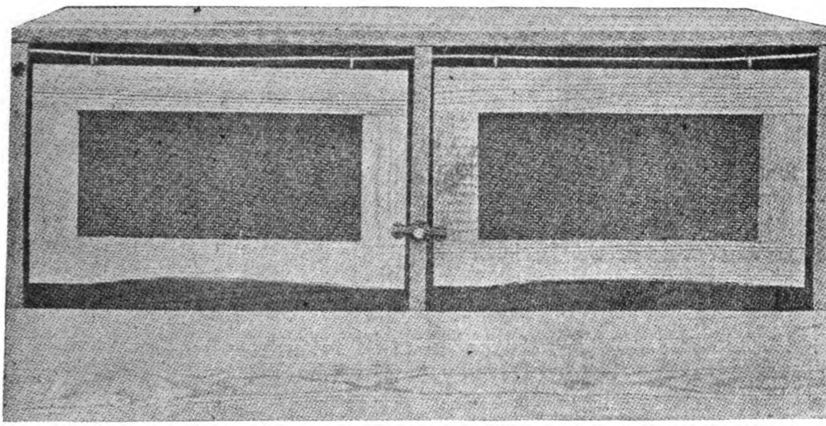


Figure 30.

Shows both doors closed and the thumb button which prevents the hens from coming out. This thumb button turns and the door opens outward when releasing the hen.

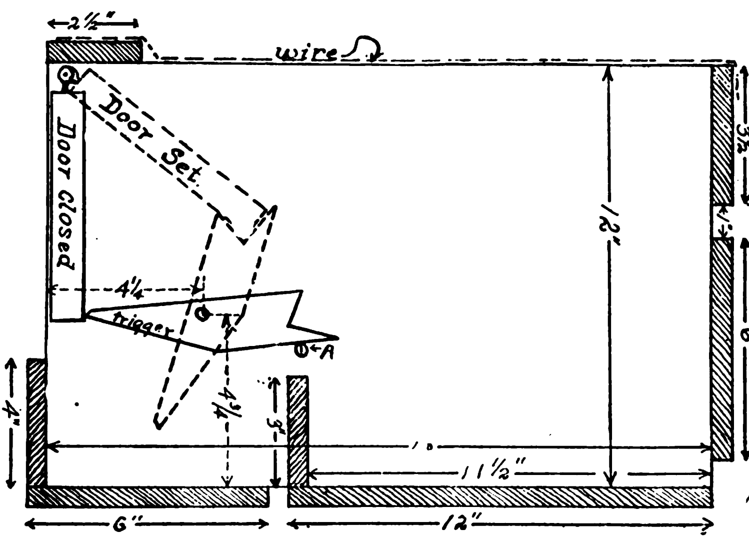


Fig. 31.—This shows the left inside wall of the nest as the nest faces you. It shows the proper location of the trigger and the partition in the nest. From this you may obtain an idea of the position of the trigger with the door opened and also with it closed. The door is set and rests on the trigger. and the hen touches it with her back as she passes into the nest. The trigger falls, the door closes and the hen is caught. A nail is driven at A to catch the trigger so that its point locks the door.

It is necessary to drive a nail into the side of the box in such a manner as to check the falling trigger, when the sharp end rises to a point where it safely locks the door. (See letter A, Fig. 31.) The point of the trigger should rest near the bottom of the door when the door is closed. The trigger resting on the back of the door prevents any hen on the outside from coming in and the door closing against the button or screw prevents the hen in the nest from relieving herself.

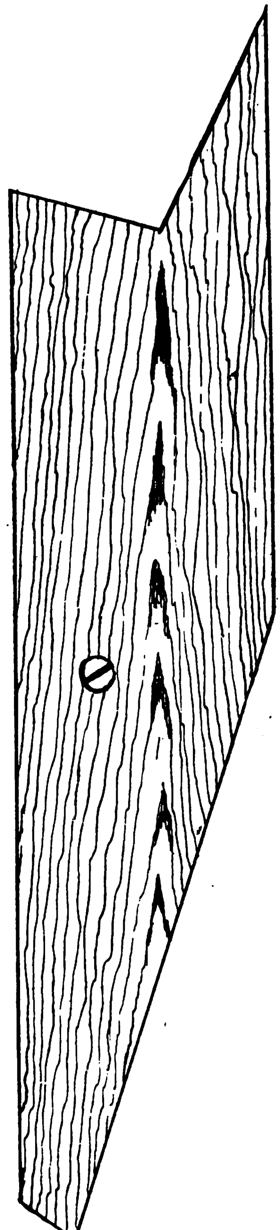


Fig. 32.

This shows the exact size of the trigger to use, also the location for the screw hole so that the trigger will be properly balanced. See that the trigger works freely on the screw and does not bind on the side of the nest.

THE DRY MASH HOPPER

This hopper is built of lumber one-half inch in thickness, so that it will be light and easy to move, but at the same time is substantial. We usually build these hoppers to fit the length of space intended for them. They are placed on a table two feet wide and two feet high. The illustrations which are shown herewith give plans for the hopper in detail.

Many poultrymen, especially farmers, make the mistake of keeping no ground feed for their hens. For our laying hens these hoppers are kept open at all times. For the breeding stock they are opened each afternoon. Your hens will give much better results if you keep a dry mash in a hopper like this. This hopper will not waste the food if constructed as directed. Equal parts by weight of wheat, bran, cornmeal, shorts, ground oats and beef scraps make a good dry mash. Other ingredients may be added, but by all means keep some ground feed in a hopper similar to this one for the laying hens and the growing young stock.

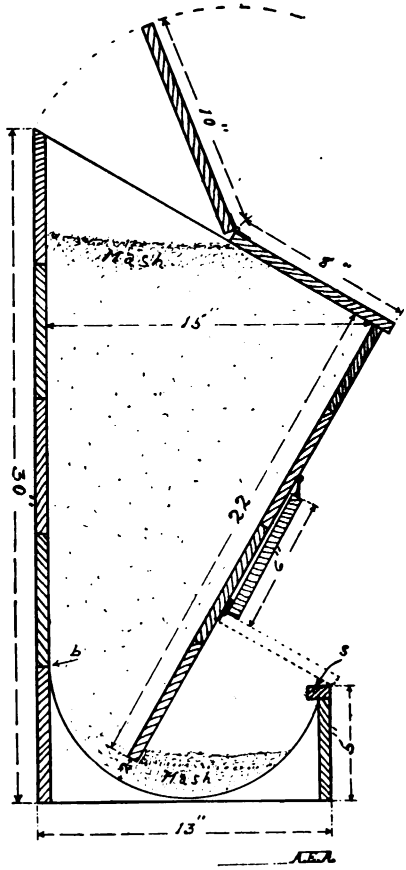


Fig. 33.

This shows a hopper for dry mash such as we use in our "fool-proof" brooding and laying house. Build them any length desired. The exact dimensions of all parts of the hopper are shown. If you will nail the lower half of the hopper lid solid and hinge the upper half at the bottom and let it drop down, it will hold just that much more feed.

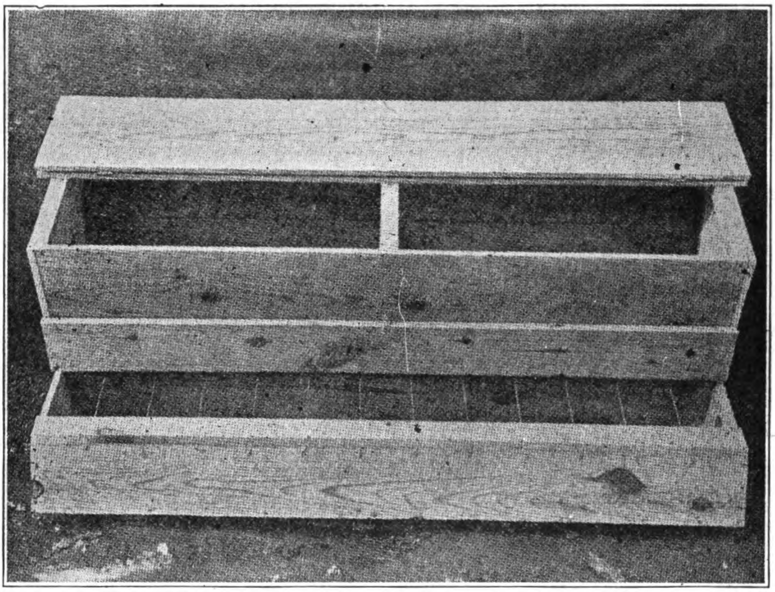


Fig. 34.
A dry mash hopper four and one-half feet long, which holds over 150 pounds of dry mash. The opening through which the fowls eat should be four inches in the clear. Wires are placed across this opening three inches apart to prevent the birds from getting in, and also prevents them from flipping the mash out. This shows the top door open, ready for filling.

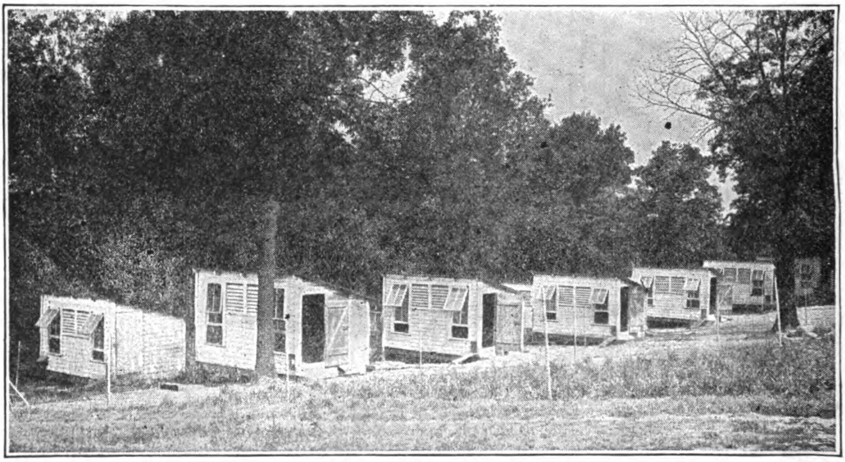


Fig. 35.
Fool-Proof Poultry Houses used in the American Egg-Laying Contest by the American Poultry School.

FEED BINS

Handy devices which save steps and labor are among the most important essentials to profitable poultry keeping. No poultry house may be said to be really complete which does not provide for storing sufficient scratch grain in the house to last one or two weeks, or even a month. Fig. 36 shows the grain box which is built just beneath each ventilator in all of the "fool-proof" houses illustrated and described in these lessons. This box holds

from one to two hundred pounds of scratch feed. Note that the top is made slanting, so the fowls cannot roost on it. This box is not only a great saving of steps and labor, but renders it more easy to keep an account with the flock, since a hundred pounds of grain or more can be weighed out and charged to them at a time. A cup or measure should be kept in each box, so that there will be no "guess work" about feeding the flock.

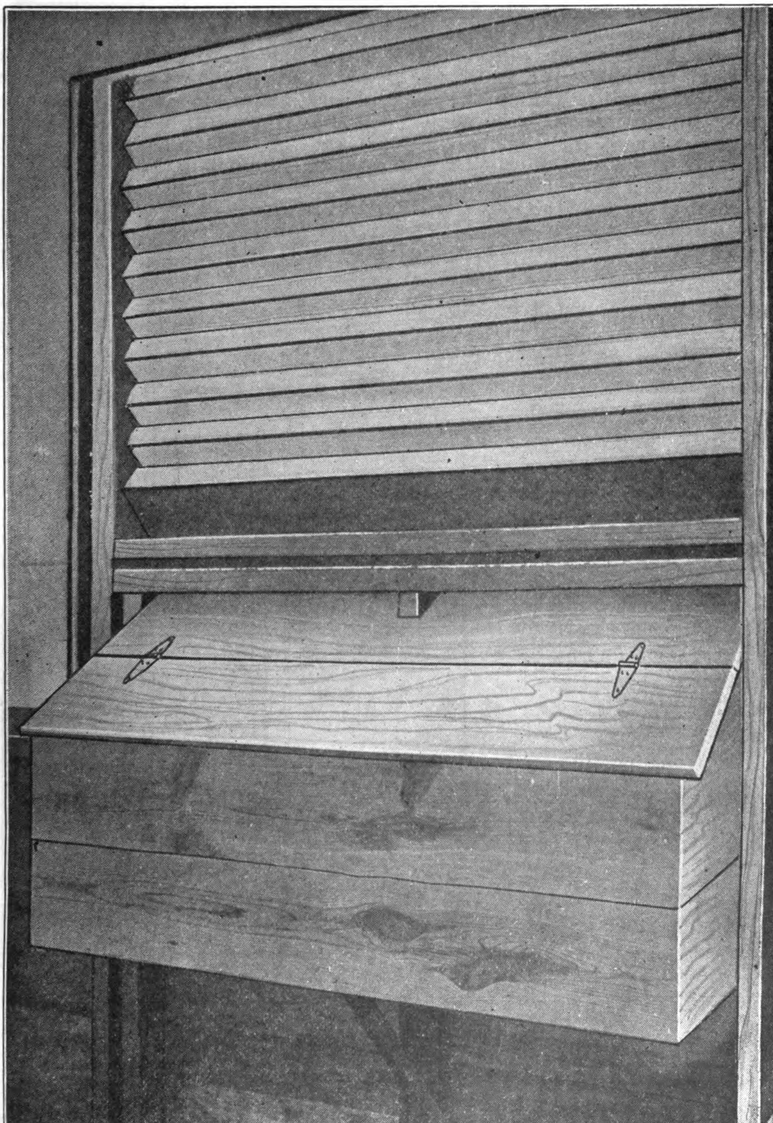
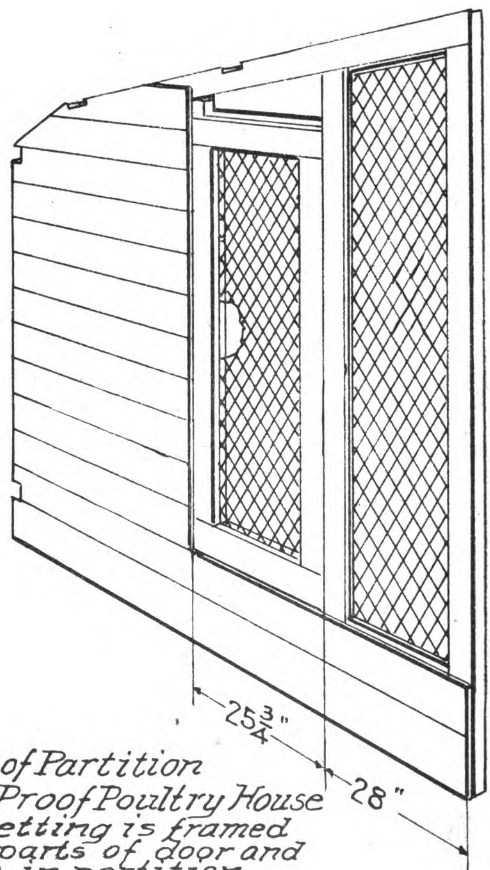


Fig. 36.—This shows the feed bin on the interior of the house beneath the ventilator These bins can be made any size and should not be made to hold less than 100 lbs. of grain. Storing your feed in this manner will save the labor of carrying small quantities of feed night and morning. The top is slanted and hinged. An opening can be made on the outside of the building so that the box may be filled without going into the house. In that case make the outside opening water tight. You will note that each ventilator has a thin piece of batten or tin tacked along the edge of the interior of each ventilator to keep out rain and snow and force the draft upward.

PARTITIONS

Where a house is intended for breeding purposes and poultry is to be yarded in front of the building, it is necessary to have partitions in the house to separate the different pens. If the house is to be used for a large flock of laying hens, it will save much labor in caring for the birds and give each fowl a larger space to exercise in if the partitions are just sixteen feet long in a 20-foot house, extending beyond the roosting quarters. This leaves a space of four feet as shown in Fig. 62, for the birds and the attendant to use as a passageway, free from any obstruction or doors from one end of the house to the other. These partitions are intended only for the purpose of preventing drafts in the house and to protect the fowls on the roosts. The partitions should be solid, at least a few feet from the rear wall, and the front portion may be poultry netting. Have two feet of solid boards below the wire to prevent male birds from fighting. The doors or openings in all partitions should be placed exactly opposite each other. The board partitions should be every fourteen feet in the breeding or farmer's house, and every twenty feet in the long laying house. Plaster board makes a very satisfactory partition. All partitions should strike the center of the shutter ventilator. These ventilators give best results when partitions run to the center of them.

Fig. 37.—The partitions in this house may be made of cloth, heavy domestic or canvas. The studs can be put in and, instead of using lumber, you can often cheapen it by using cloth and coating it with "Tector," sold by the Pittsburgh Plate Glass Company. The back, next to the roost, is boarded up or covered as mentioned above. This prevents drafts near the roosts. The door and the front portion of the partition can be covered with wire as shown. We board all partitions up high enough so that male birds will not be tempted to fight and injure one another.



Perspective of Partition
For 8'-0"x10'-0" Fool Proof Poultry House
Note, wire netting is framed in between the parts of door and between strips in partition

EXITS

There should be one exit to each section of the house. All exits should be about 8 to 12 inches from the floor to prevent the litter from being scratched from the floor into the yards. It is a good idea to put a board on a bracket on the exterior of the house, just below the exit. This gives the fowls something to fly upon before entering the house. These exits should be placed near the center if the yard fence runs to the center of the house, then when one person tries to drive the fowls into the house alone, the opening into the house is in the corner next to the fence so that no trouble is experienced in herding the birds and driving them into the house.

CONVENIENT ARRANGEMENT OF INTERIOR

We have made recommendations as to what we think is a splendid arrangement for the interior of your poultry house. This arrangement has proven most satisfactory with us, but conditions vary with different poultrymen and farmers and we have to urge you to use your own common sense in arranging the roosts, nests, hoppers, drinking pans, bins, etc. The main thing to keep in view is the comfort of your fowls and the convenience for your own benefit, so as to save labor in caring for the poultry.

THE DRINKING PAN

The drinking pan should be placed on a table built for that purpose. The table should be about two feet from the floor. (Fig. 23.) In good weather it is best to have the pan located in some shady spot in the yard. The object you should have in mind is to protect the drinking pan from filth and trash. Water should be piped to it or near it, so as to save all the labor possible. The pan should be so protected that the fowls cannot get into it with their feet or easily turn it over, and still be easy of access. Pure water is as essential as pure food. The drinking pan and the small table containing it can be placed in any space about the walls or building which is not used for other purposes.

THE LITTER

Clean straw, free from mold, or shavings, leaves or sand, should be placed on the floor of the poultry house providing it is board or concrete. We prefer a straw litter four to six inches deep over the concrete floor. The grain is thrown into this and the fowls are compelled to work for all their feed. Thus on bad, wintry days the hens may be confined to the house and be kept busy, contented and happy. By all means see that the litter is clean and free from must and mold. If your floors are inclined to be damp, cover them with one or two inches of sand and only use from two to four inches of litter. The litter should not be more than two to four inches deep during the summer months.

SHADE

Fruit trees, such as cherries or apples, make suitable shade for poultry yards. Fowls often suffer greatly in summer months from the heat, and every poultry yard should have shade provided. The shade should not be so dense that it keeps all the sunlight from the yard. A few trees is all that is really necessary. Most varieties of fruit do well in poultry yards. Poultry fertilizes the soil and aids in keeping down injurious insects. Some allow grape vines to grow along the poultry fences. Others sow sunflowers or corn for shade, and fence off that portion of the yard temporarily. A cornfield makes a good place for young stock to run. If you can provide shade in no other way, drive down some stakes and cover a frame with burlap.

FENCES

A height of about five or six feet is sufficient for any poultry fence. If you are troubled with fowls flying over, clip about half of the long wing feathers on only one wing. If you will leave the half of the wing feathers next to the body uncut, it will be impossible for the bird to fly very satisfactorily, and this permits it to fold the clipped portion of the wing under and does not injure the appearance of the fowl. Do not clip the wing of any bird intended for show purposes. We do not like the use of fine

two-inch mesh wire for poultry fence. Most wire manufacturers make a heavier poultry fence, much like a stock fence, only lighter wire and smaller mesh, and a fence which will last and retain its shape. We prefer the use of eighteen-inch poultry netting, one-inch mesh, at the bottom, or put two feet of boards on the bottom to prevent the fighting of male birds. Avoid all the fencing you possibly can.

CULTIVATION OF YARDS, AND CROPS TO GROW

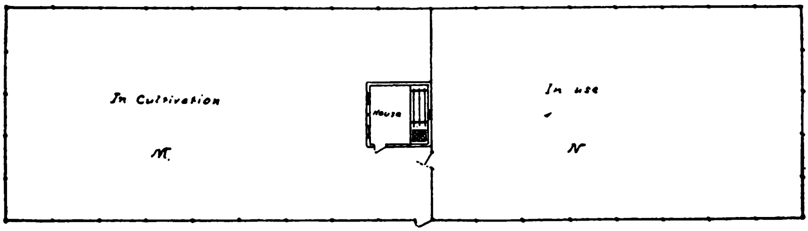


Fig. 38.

By using a window in the rear of your house you can divide your yards the long way and let your poultry pass out through this window and use the north yard in summer and the south yard in winter. You can alternate the yards and thus cultivate one while the poultry use the other.

Yards must be cultivated if they are to be kept sweet and clean. While the yards are being cultivated, you had just as well grow some green food for the poultry. Cultivation of the yards also gives the fowls more exercise, as well as cleanses the yards. The crops use up the manure, and prevent the spreading of disease. The yards may be used in which to grow certain vegetables for the family, or such crops as wheat, oats, rye, corn, clover, vetch, rape or soy beans may be grown. All of these are good and by all

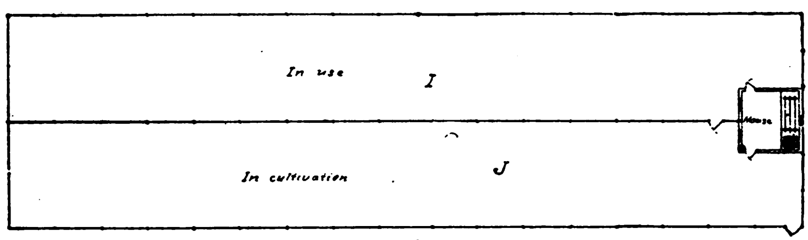


Fig. 39.

Where you have a good sized flock in a single house, by having an exit on each side of the house, you can divide your yard into two parts and allow the birds the use of one yard while you are cultivating and growing something in the other. Alternate your pens in this way and always keep some green food growing and you will always have fresh ground and clean yards.

means you should make a selection of some of them and never try to raise or keep poultry continually on bare yards. Bare and uncultivated yards will mean your downfall sooner or later.

SYSTEM OF YARDING

If your poultry is to do well where they are confined to small quarters and kept yarded year after year, it is absolutely essential that you provide some method of furnishing them fresh soil on which to run for at least a portion of the time. Poultry cannot do well and will sooner or later lose its vitality if forced to be confined to small quarters and use bare yards year after year. The breeding stock produces more fertile eggs, which hatch more vigorous chicks, where they have plenty of free range. Poultry can be raised successfully for an indifinite length of time if a double yarding system is used such as is illustrated herewith. By some such method one yard can be cultivated while another is in use. Spade them or plow them and keep some green food growing. This sweetens the soil and also furnishes considerable feed for the poultry and makes your yards look much more attractive.

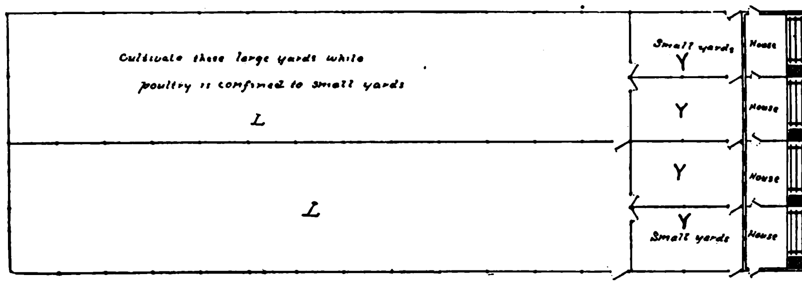


Fig. 40.

If you have a house with two or four or more sections you can arrange small yards in front of each section of the house as shown by Y. Then the poultry can be confiined to these small yards temporarily while you are cultivating and growing green food in yards L and L. After the green food is up so that the fowls cannot easily kill it by eating it, you can then alternate the birds in the small pens by allowing one flock the use of the large yards every other day.

THE QUISENBERRY FOOL-PROOF POULTRY HOUSE, 14x28 FT.

Having discussed the general principles of poultry housing we come now to the practical application of these principles. There are three general types or styles of houses which are in general use. They are first, a house for the general farm flock; second, a laying house for a large number of hens kept for commercial egg production; third, a colony house for growing stock or for small breeding pens. All of these houses can and should be built along the same general lines, same material, style of roof, system of ventilation, etc.

Let us first consider in detail a house suitable for the ordinary farm flock.

Housing has considerable to do with the health and vigor of the breeding flock; with the number of eggs laid; with the fertility of the egg and with the livability of the chicks after they are hatched. If a farmer is to get the best results from his poultry, he must have them comfortably housed. If kept painted, a house like this will last a lifetime, and the increased egg production and the improvement in the health of the fowls will soon pay for the cost. Your poultry will prove a pleasure to you.

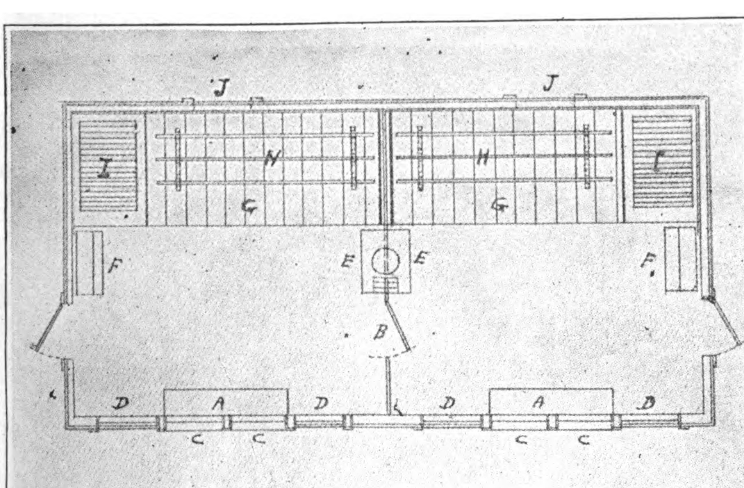


Fig. 41.—Floor plan: A, feed bins; B, swing door; C, ventilators; D. windows; E, drinking plan; F, dry mash hoppers; G, droppings boards; H, roosts; I, broody coops; J, rear windows.

This house is twenty-eight feet long, fourteen feet wide, eight feet high in front and six feet high in the rear. Will comfortably house about 100 to 125 hens. Foundation and floor are of concrete, floor being about one foot above the level of outside ground. Distance between end and center windows is nine feet. Center windows are two feet apart. Windows are placed as high up as possible in order that sun may shine clear to back of house in winter. Upper sash is hinged at top, swinging outward. Lower sash slides up and down. Each ventilator is about two and one-half feet high and in length fills the space between the two windows. Slats in ventilators are about 1x6's set at an angle of about forty-five degrees. Distance between slats is about one and one-half inches. Exits for chickens beneath end windows are 12x12 inches, with doors hinged at side, opening outward. Doors in each end are 3x6 feet. Siding may be either drop siding or ship-lap—any tongued and grooved material. Never use boards and battens on a poultry house if you can secure drop siding, ship-lap or car siding at a reasonable price.

Note the long, narrow ventilators just beneath the eaves, hinged at the top and swinging outward. They are for ventilating purposes in hot weather and are kept open only in summer. The four windows shown are all hinged at the top and swing outward. They admit light onto scratching floor in winter and increase ventilation in summer. We recommend the use of only one such window to each 14-foot section. In winter these must be closed and made air-tight and muslin or canvas tacked over them on the interior of the house. Bottom of windows are eight inches above floor. Each sash measures 24x26 inches, the panes measuring 10x12 inches. Roof is sheeted and covered with two-ply prepared roofing, all joints and seams being rendered air-tight with waterproof tar paint.

If you want to use one section of this house for a breeding pen of thirty to fifty females and two or three male birds of the same variety you can do so. If you prefer to use smaller matings, say one male with ten to fifteen females, you can run a temporary wire partition through each section and make each pen seven by fourteen feet. This temporary partition can be removed as soon as the breeding season is over.

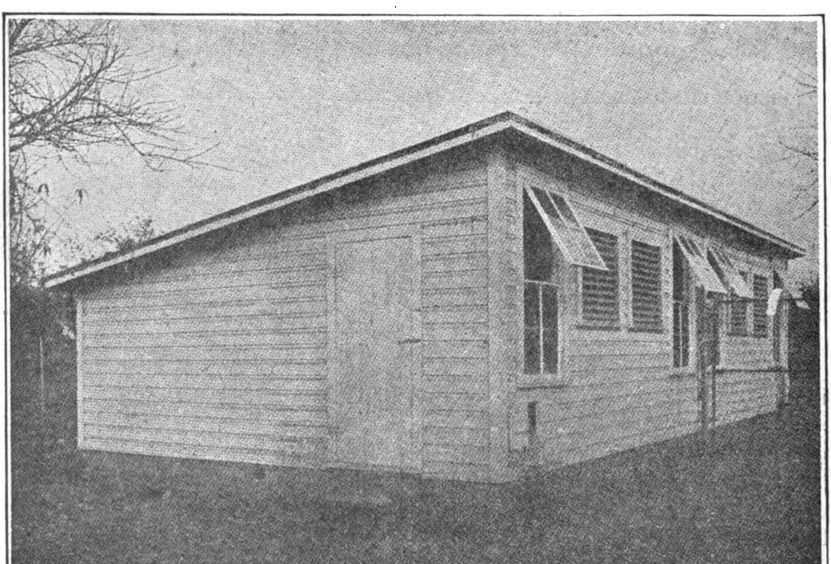


Fig. 42.—Front view of the Quisenberry "Fool-Proof" Poultry House. This plan works better than the average house.

Droppings platform is four feet wide and three and one-half feet above the floor. Boards in droppings platform run crosswise to facilitate cleaning. Note ceiling above and back of roosts down even with droppings platform. A cheap grade of flooring may be used for both drop-

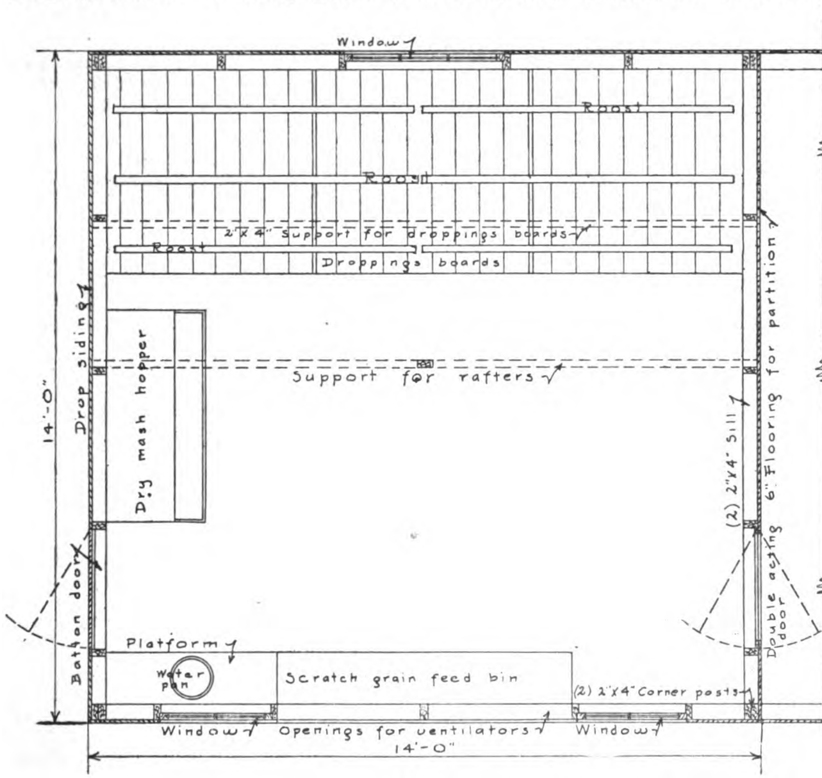


Fig. 42A.

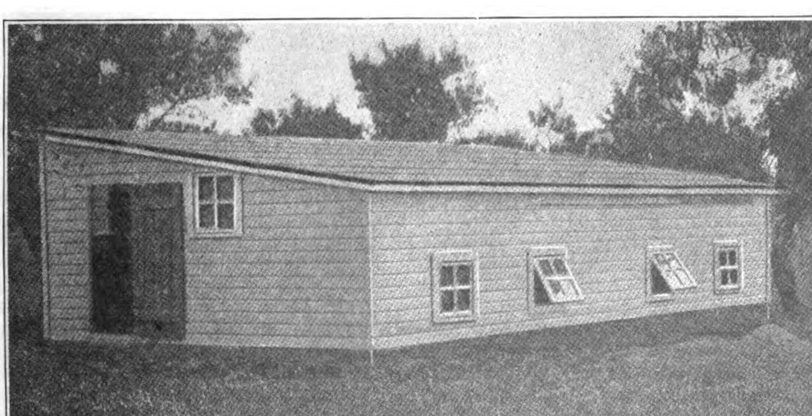
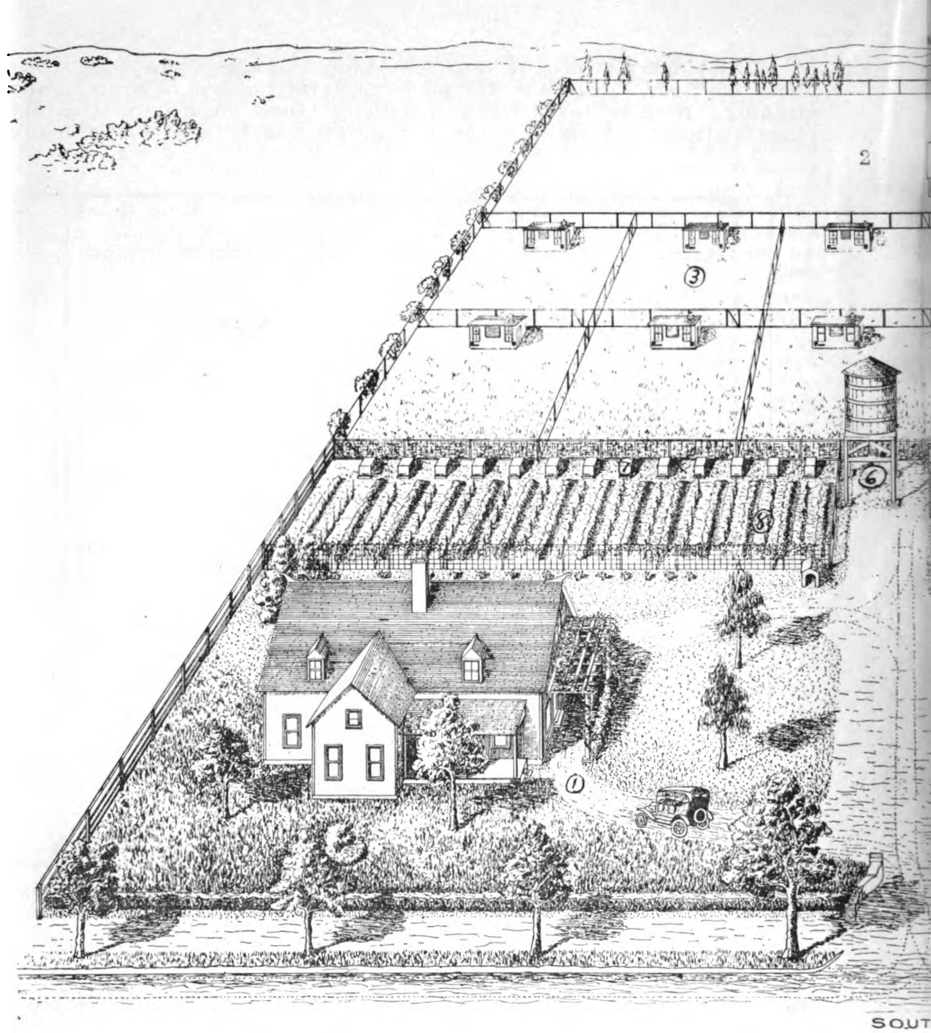
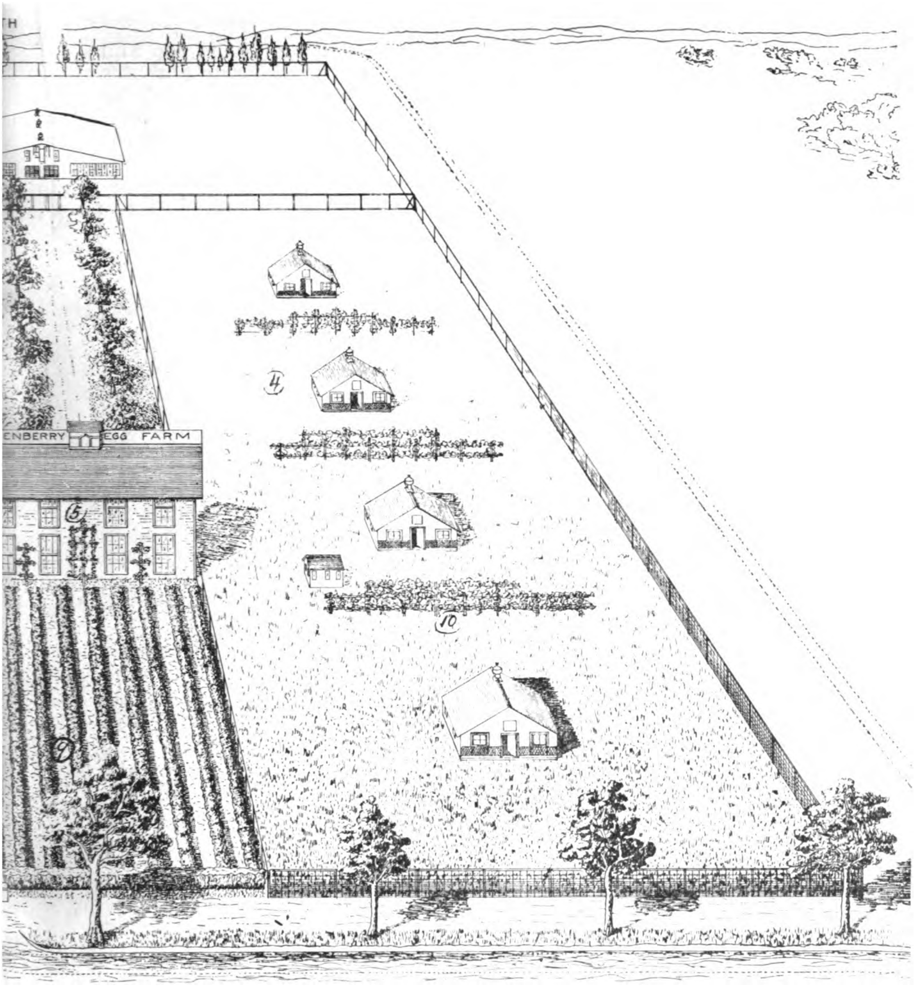


Fig. 43.—Rear view of the Quisenberry "Fool-Proof" Poultry House. Use only one window in the rear of each section of the house instead of two windows.



ARRANGEMENT OF I

No. 1. Residence and lawn. No. 2. Large laying house in rear of farm. This house is 48x60 feet, and is large enough to accommodate 800 to 1,000 layers. No. 3. Breeding pens and 'Fool-Proof' breeding houses. These houses can be built 8x12, 14x14, or of such size as to meet the requirements of the poultryman. Partition fences can be put in and each house made to house a breeding pen in each end of the house. We recommend providing shade trees of some sort, or vines on the fences, or shrubbery in the yards for the protection of the breeding birds. No. 4. Houses and yards for the growing stock. Brooder houses shown here are of the Missouri type. These are described in Lessons 3 and 4 but "Fool-Proof houses, built 14 feet square or built 10 feet deep and 16 feet long, would answer every purpose. The brooder stoves could be placed in one corner or one end of the Fool-Proof houses and the results would be most excellent. Five hundred chicks can be brooded in each one of these houses, and larger flocks could be brooded in larger houses. No. 5. This is the Central Administration House, which can be used for storing feed, conditioning birds, incubator room, shipping room, and for similar

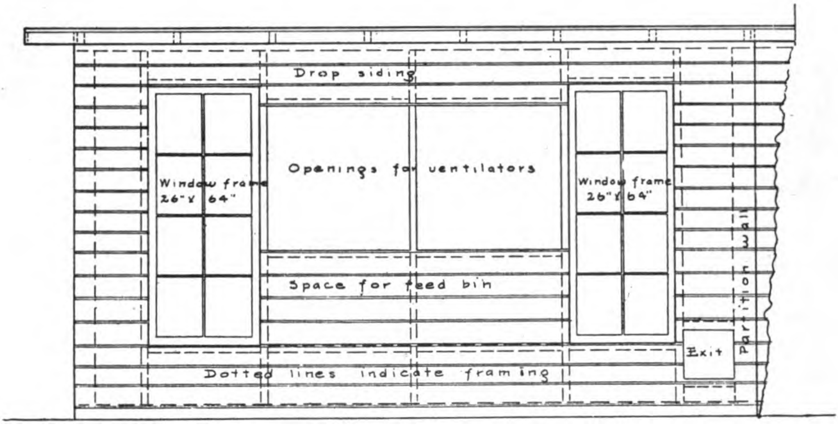


:. 44.

RM AND BUILDINGS

purposes. It can also be used as a garage and general utility house. No. 6. This shows the tower and tank for the water supply. It is important to have water piped to each yard, so as to save labor if possible. No. 7. This shows hives of bees which are sometimes a help to the poultry farm and bring quite a good deal of revenue if looked after properly. No. 8. This is the space for a family garden and sometimes there is a surplus for sale. No. 9. Small patch of strawberries or small fruit often adds a great deal to the revenue of a small farm. No. 10. Grape vines, strawberries or fruit may be used as shade for the birds, as well as an ornament to the farm itself. We recommend planting a row of fruit trees around the entire farm and locating them at other points where they will do best and add to the appearance of the place. Poultrymen need not build all these buildings at one time, if their finances will not permit. But locate each building with a view to the completed general arrangement when the farm is finally finished. This represents a five-acre tract, but can be used on smaller or larger areas with equally good results.

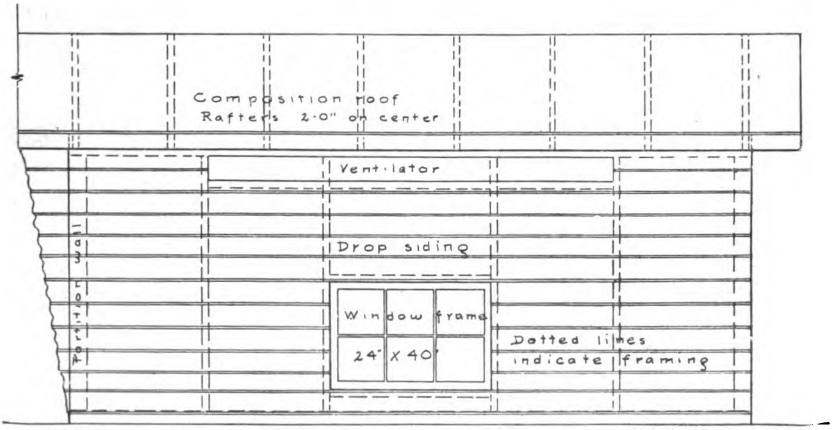
pings platform and ceiling. Roosts are 1x2's, rounded off at the top and nailed to 2x6's. The 2x6's merely set on droppings platform and are easily and quickly removed. Nests are set on a shelf supported by brackets just beneath the droppings platform. Those shown in illustration are home-made nests. Water pan and feed hopper are both set on tables two feet above the floor, so that litter cannot be scratched into them and so that the entire floor is left free for scratching purposes. At least four to six inches of straw should be kept on the floor at all times.



FRONT ELEVATION (SOUTH)

Fig. 45.—Shows openings for ventilator, feed bin, windows and exit.

No more simple, inexpensive, convenient or satisfactory poultry house can be built than this one for use as a farmer's breeding house or for use on a city lot. Where the house is intended for a small flock on a city lot, we would recommend that it be built in a single section 8x10 or 12 or 14 feet square. For farm use, build it only in sections 14 feet square, and build one or as many sections as you need to accommodate your flock. Avoid all the fencing you possibly can and give your flock free range if possible. If one section of the house is used on a city lot, then build a small double yard like that described in another portion of this book, and confine



REAR ELEVATION (NORTH)

Fig. 46.

your poultry so they will not prove a nuisance to your neighbors or destroy your own garden.

Bill of Nails for Farmer's Fool-Proof Poultry House 14x28

6 lbs. 16p. common nails.	4 lbs. 8p. finish nails
25 lbs. 8p. common nails	2 lbs. 6p. finish nails
8 lbs. 6p. common nails	1 lb. 3p. common nails

Bill of Hardware for Farmer's Fool-Proof Poultry House 14x28

2 pr. 5-in. T-hinges for main doors	8 spring window bolts for lower sash
2 hooks and staples for same	1 pr. double swing hinges for partition doors
3 prs. wrought butts, 2x2, for back ventilator	30 feet of poultry netting, 1-in. mesh, 28 in. wide windows.
4 pairs wrought butts, 2x2, for small back door	½ dozen hooks and eyes
4 pairs wrought butts, 2½x2, for top sash	

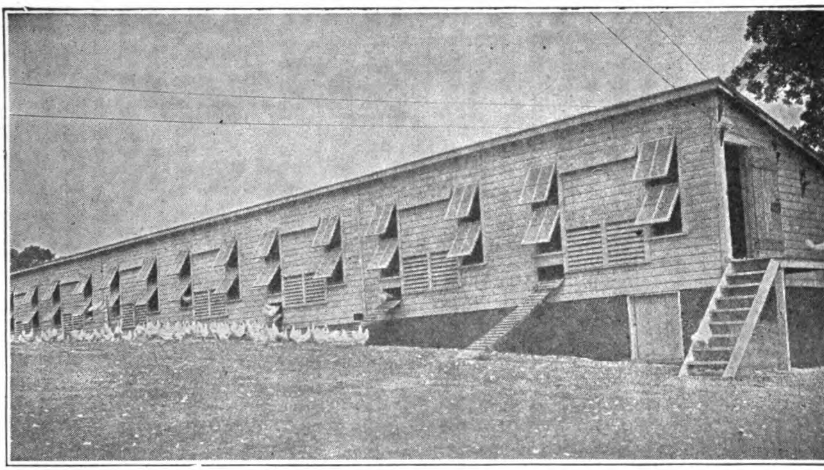


Fig. 47.
Fool-Proof laying house 100 feet long on the Experiment Station of the American Poultry School. We keep the top ventilator open about 2 inches, even in winter months. The circulation of air will help to keep the house dry.

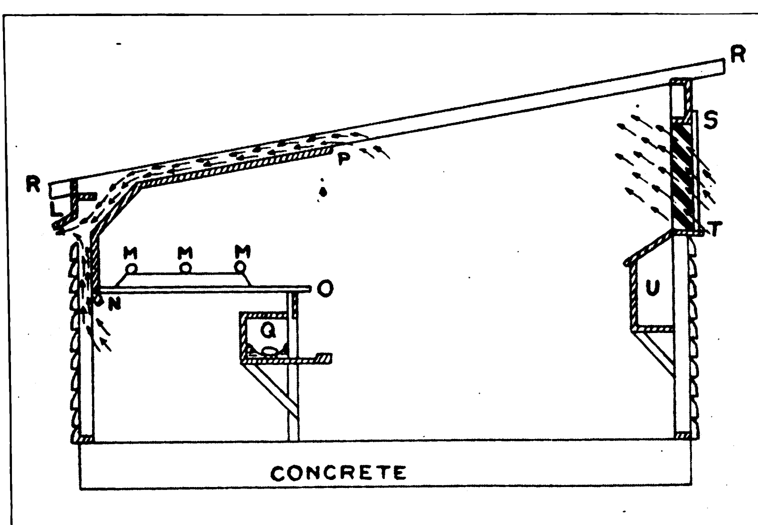


Fig. 48.—Is a cross section of the Quisenberry "Fool-Proof" Poultry House. M is a roost pole. O is droppings platform. Q is the nest underneath, L is the back ventilator, U is the bin for the grain, S and T are the front ventilators.

Bill of Material for a Farmer's Fool-Proof Poultry House, 14 Feet Wide, 28 Feet Long, 8 Feet High in Front, 6 Feet High in Back

No.	NAME	No. of pieces	Sizes	Length	Kind of material	How used, etc.	No. ft. per piece	Total feet	Remarks
2	Front sill	2	2x6	14	Pine		14	28	
2	Back sill	2	2x6	14	Pine		14	28	
2	End sill	2	2x6	14	Pine	Box sills	14	28	
4	2 front, 2 rear	4	2x6	14	Pine	Single sills can be	9 1-3	37 1-3	
2	1 for each end	2	2x4	14	Pine	used	9 1-3	18 2-3	
17	Front studding	9	2x4	16	Pine		10 1-3	96	1 each end.
15	Back studding	8	2x4	12	Pine		8	64	1 piece left over.
2	Front plates	2	2x4	14	Pine		9 1-2	18 2-3	1 piece left over.
2	Back plates	2	2x4	14	Pine		9 1-3	18 2-3	
10	End studding	5	2x4	14	Pine		9 1-3	48 1-3	
5	Partition studding	2	2x4	14	Pine		9 1-3	18 1-3	Use one left over.
15	Rafters	15	2x4	16	Pine		19 2-3	160	
2	Center supports	2	2x4	14	Pine		9 1-3	18 2-3	
2	Post for same	1	2x4	16	Pine		10 1-3	10 1-3	
7	Siding lengths	14	1x6	14	Pine	Front siding (drop)	7	98	5 boards under window,
14	Siding	14	1x6	14	Pine	Front siding (drop)	7	98	2 above.
2	End siding	4	1x6	14	Pine		7	28	2 for each end under door.
16	Siding lengths	32	1x6	12	Pine	End siding	6	192	16 boards to the end.
14	Siding lengths	28	1x6	14	Pine	Back siding	7	196	
2	Back ventilator boards	2	1x8	14	Pine	Ship-lap	10 1-3	576	
46	Inside lining lengths	46	1x6	14	Pine	Flooring	7	322	
54	Roof sheeting	54	1x8	16	Pine	Ship-lap	10 1-3	576	
	Rubberoid roofing	5							
2	Outside door frames	2	1x6	16	Pine		8	16	
2	Outside door casings	2	1x4	16	Pine		5 1-3	10 2-3	
2	Outside door sills	2	2x8	8	Pine	Cuts both sills	10 2-3	10 2-3	
4	Front window frames	4	1x6	14	Pine		7	28	
4	Front window sills	1	2x6	12	Pine	Cuts four sills	12	12	
4	Front window casing	4	1x4	14	Pine	Cut sides and head	4 2-3	18 2-3	
2	Back window frames	2	1x6	16	Pine	Cuts jambs, head and sills	8	16	
2	Back casing	2	1x4	12	Pine	Cuts sides and head	4	8	
4	Front ventilator frames	4	1x4	12	Pine		4	16	
44	Ventilator slats	8	1x5½	14	Pine		6 5-12	51	
4	Ventilator casing	4	1x4	10	Pine		3 1-3	13 1-3	
2	Indoor flooring	6	1x6	12	Pine		6	36	
1	Facing all around	6	1x4	16	Pine		5 1-3	32	
1	Partition	7	1x6	14	Pine	Cut to fit	7	49	
1	Partition door	1	1x4	16	Pine		5 1-3	5 1-3	
8	Corner boards	4	1x4	16	Pine		5 1-3	21 1-3	
12	Ship-laps for droppings boards	12	1x8	16	Pine		10 2-3	128	
2	Droppings board supports	2	2x4	14	Pine		9 1-3	18 2-3	
2	Back supporters	2	1x2	14	Pine	Nail to wall	2 1-3	4 2-3	
8	Roostpole supports	2	2x4	12	Pine		8	76	
16	Roost poles	4	1x2	14	Pine		4 2-3	18 2-3	
66	Flooring boards	66	1x6	14	Pine		5 1-3	352	
13	For joists	13	2x6	14	Pine		14	182	
4	Full windows					8 lights 10x14	Per	W.	
1	Full windows					8 lights 10x12	Per	W.	Back half windows.

MATERIAL USED IN CONSTRUCTION OF CONCRETE FLOORS

The following material is required in the construction of a concrete floor and foundation for a "fool-proof" house 14x14 feet:

1. Six loads or yards of cinders or rock or part of each.
2. Five yards of gravel and sand. Prices vary and farmers can often get creek gravel and sand simply for the hauling.
3. Seventeen sacks of cement.

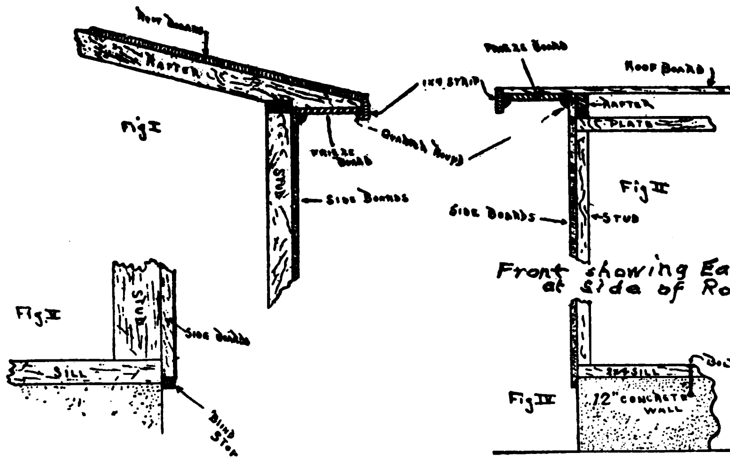


Fig. 49.

Courtesy of the American Poultry Journal. Fig. 1 shows how an air-tight eave can be made at the rear of the house. Fig. 2 shows how the eaves can be blocked at the sides of the roof to make the ends tight. Figs. 4 and 5 show the foundations and sills. The foundation should be four inches thick, and a foot above the ground and a foot in the ground.

4. It should require one man not over thirty-six hours to build a 14x14 floor and foundation, or three men twelve hours each.
5. The four 14-foot boards around the foundation, which make the form to hold the cement and filler in place, can be used as sheeting for the roof.

FOOL-PROOF 8x10 COLONY HOUSE

This house is designed and used largely for a city lot, or as a small breeding house, or for brooding small flocks. We illustrate it here in detail, for the reason that this same design, the same plan and the same principle of ventilation and arrangement can be used with equal success to the larger types, such as 10x12, 12x12, 14x14 or 20x20-foot sections.

Fig. 50. This is No. 50 and 51. They are both for the same purpose. No. 51 is to show the double floor supports at the south and north edges of the floor where it is notched around the 2x4-inch members of the form so that the floor will have no chance to split.

The bottom members here are 2x6-inch timbers forming a rectangle with a center member of the same. Six 2x4-inch floor joists, each 8 feet long are then secured across the 8-foot dimensions the two outside ones set in from the edge of the bottom 2x6-inch member so the upright 2x4-inch members will come flush with the 2x6-inch. These 2x4's are all laid and secured in place, then the upright members are placed, using measures shown by Nos. 52 and 53, then short pieces are cut to fit in between the upright members and floor joist, as shown in No. 51. A double row for the north and south edges of the floor to support both edges of the first floor board which must be notched around the uprights. Use a spirit level to set not only the uprights but the ground members also.

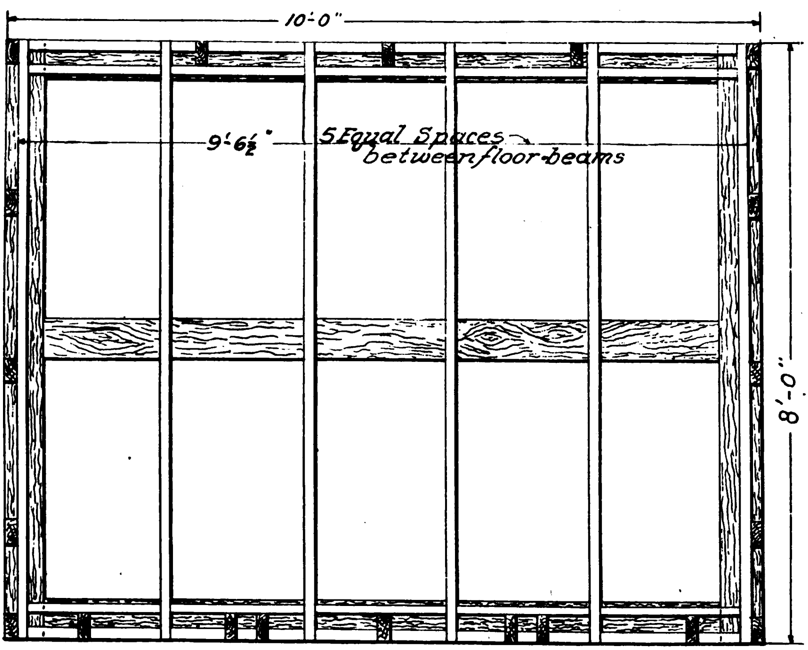
Fig. 51. This illustration is designed to show clearly the relation of all members at the bottom so that a proper start may be made and preclude tearing down to correct the start. The upright members that form the sides and ends may be placed after the 2x6-inch bottom members have been placed

and leveled up, and the roof members may be placed, then the floor joists are placed and the double row of 2x4-inch pieces are cut and fit between floor joist and uprights as shown, making a rigid arrangement and providing means to prevent the outside edge floor board from splitting where they are cut to go around the uprights. It is necessary to prevent the floor from breaking at these places to provide a rat proof floor.

Fig. 52. The spacing of the front, or south side, of the house is here shown by which the proper position of windows, ventilator and exit doors are had. The members should be first cut to size and the ones 22 inches apart should be secured to this cross member before setting up so as to nail the cross members through the uprights to make a good job. Also the two middle members that are here shown, 36 inches apart, should be secured to the uprights before setting in, for the same reason their proper alignment can be kept, because you will not need to hold the cross pieces by hand while neiling them home.

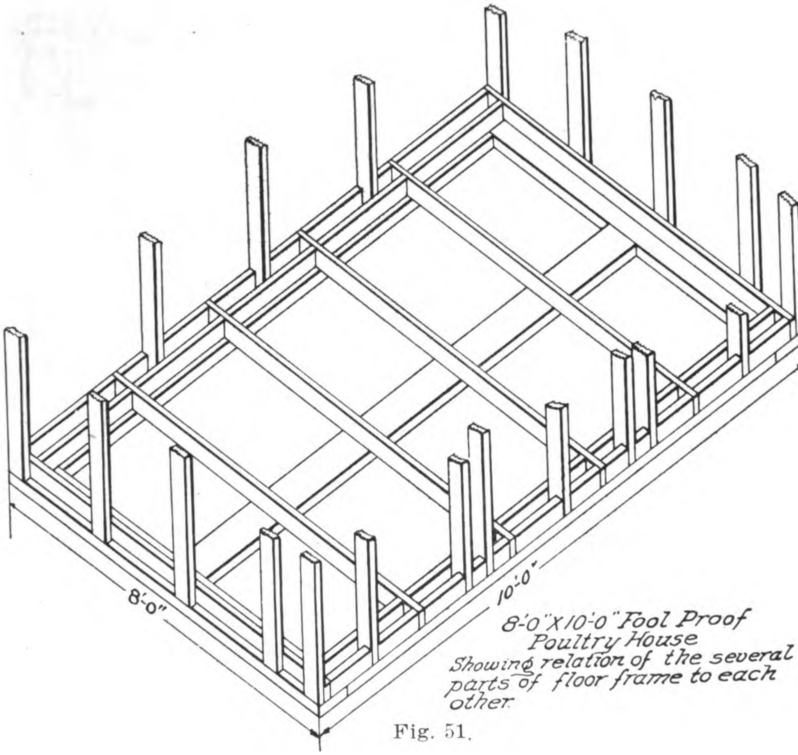
The four corner members with their top stringers and roof rafters can be set up and braed as a first step, then the intermediate members introduced snugly and in pairs with their cross members in place.

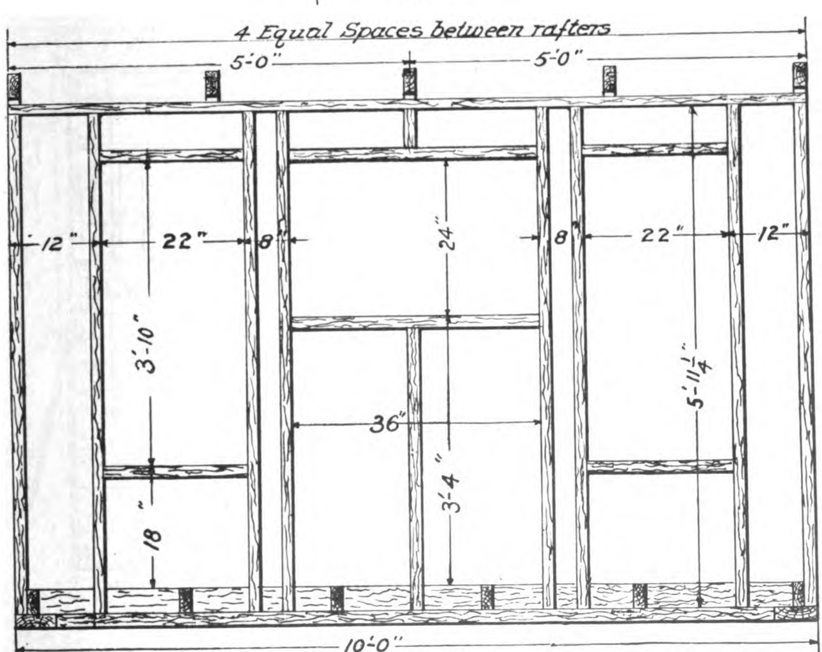
Fig. 53. This end elevation suits both the east and west ends of the house and dimensions are shown for the principal members. Those lengths not given are gotten by fitting the two outside supports by measure given while all uprights are being placed, then after the roof supports are placed, place the end supports at this bottom marking under the end roof support for both length and bevel, to make a good fit. For position of end members, measures for which are not given, they should be equally spaced between members whose positions are shown by measure.

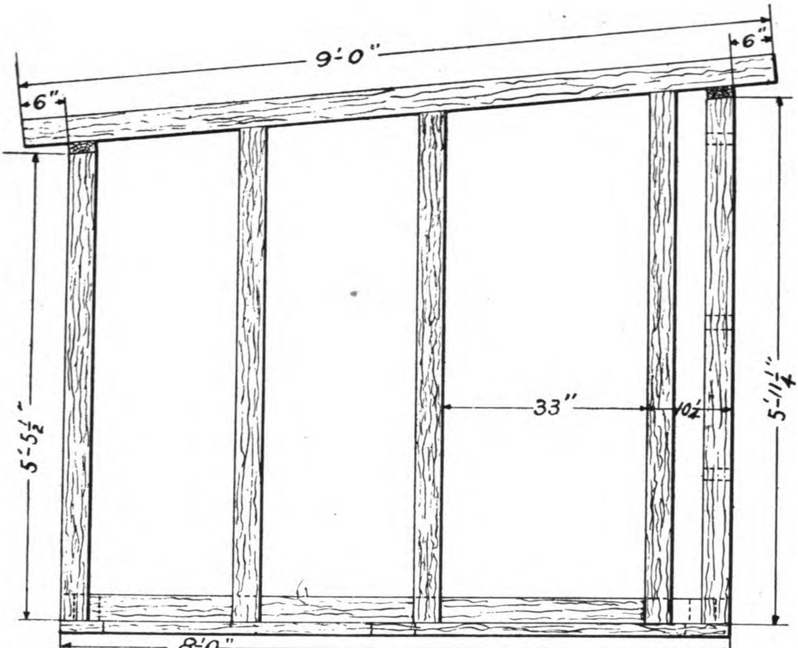


Floor Arrangement of Framing

Fig. 50.

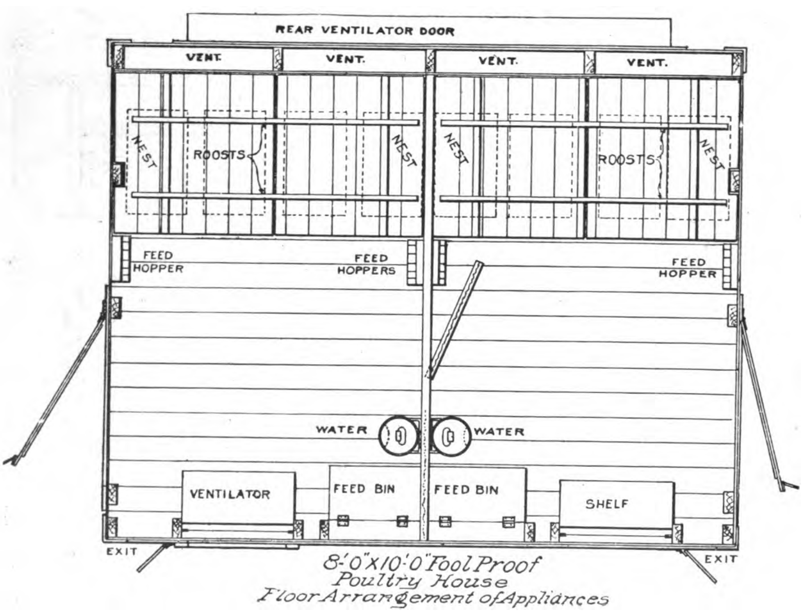

8'-0"
10'-0"
8'-0" X 10'-0" Fool Proof
Poultry House
Showing relation of the several
parts of floor frame to each
other.
Fig. 51.


4 Equal Spaces between rafters
5'-0"
5'-0"
12"
22"
8"
24"
8"
22"
12"
3'-10"
36"
5'-11 1/4
3'-4"
18"
10'-0"
Front Elevation
Fig. 52.



End Elevation

Fig. 53.



8'-0"x10'-0" Fool Proof Poultry House Floor Arrangement of Appliances

Fig. 54.

Fig. 54. This floor plan supplies a guide to what is to be in the completed building so that the builder of it can keep constantly before him the reason why each member is placed where it is and any special attention they need; and the final positions of everything within the house. Here the ventilator of the rear walls is clearly shown with relation to the four air passages to the one ventilator door at the rear of and well up under the eaves. This ventilator door is again shown in No. 57 with measures shown for its placement and size. The door in the center partition may be hinged to the rear and swing the same as the outside doors. We really prefer it that way. Note the position of all ventilators, hoppers, water pans, feed bins, roosts and nests. These can be located elsewhere if necessary to meet your particular requirements.

Fig. 55. This illustration is particularly needful to understand the entire scheme of this ventilator system construction and is illustrated as a cross section at A A of No. 59. Here measures for placing the nest supports are given as well as measures for the ventilators so that a correct relation may be maintained between the nests and the space they occupy in the space to be ventilated. This section will aid in framing the house so no cutting or changing need be made to provide for all features of the ventilator system, especially when kept in mind together with the other illustrations of the various sections of this 8x10-foot house. Note the location of the nests, feed bin, the ventilators and the manner in which the air circulates in the house.

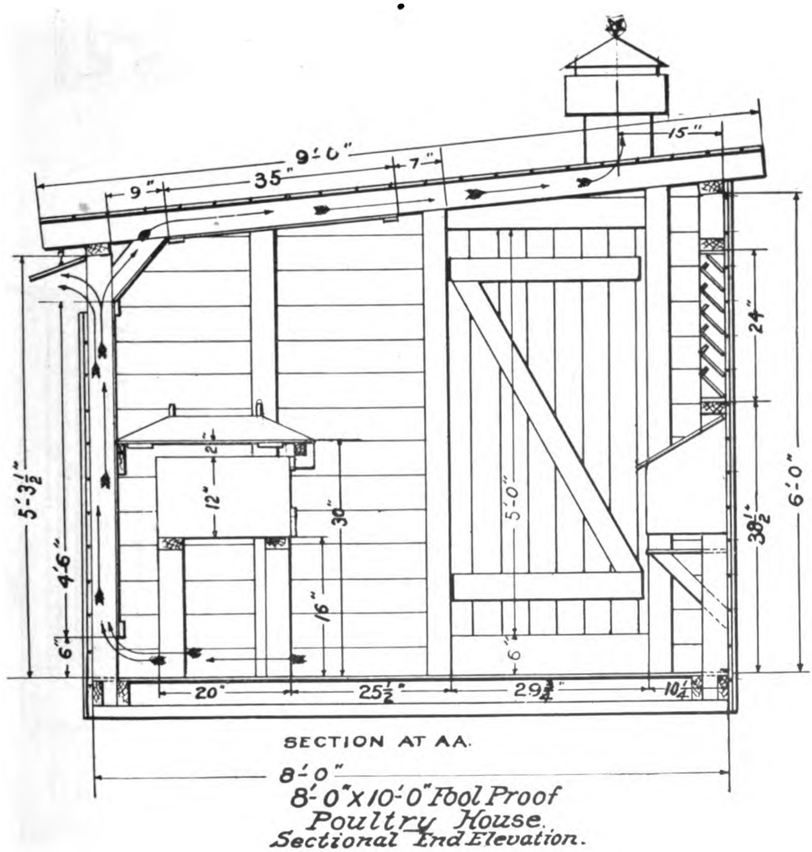
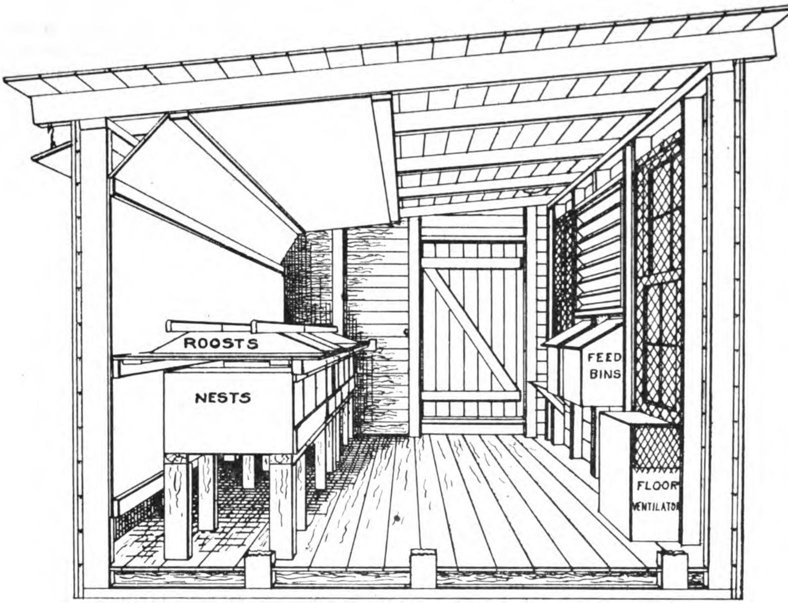
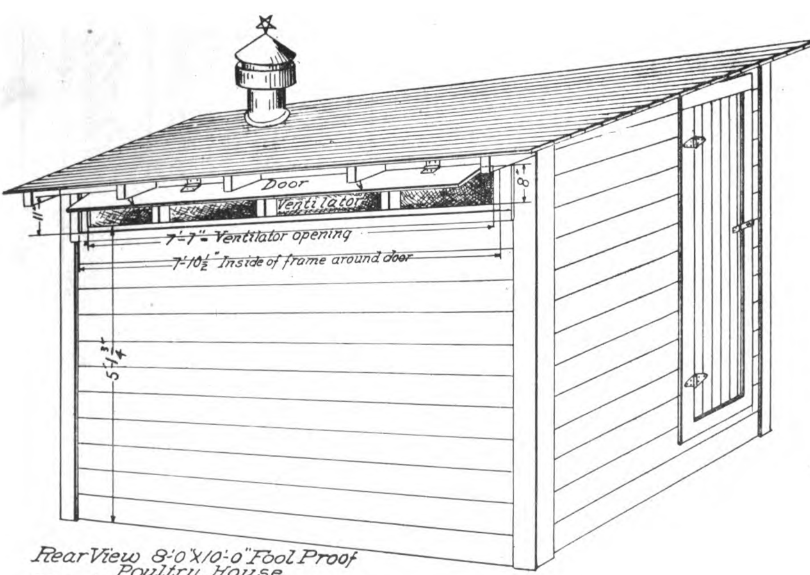


Fig. 55.



8'-0"x10'-0" Fool Proof Poultry House
Interior Arrangement.
With Partition Removed.

Fig 56.



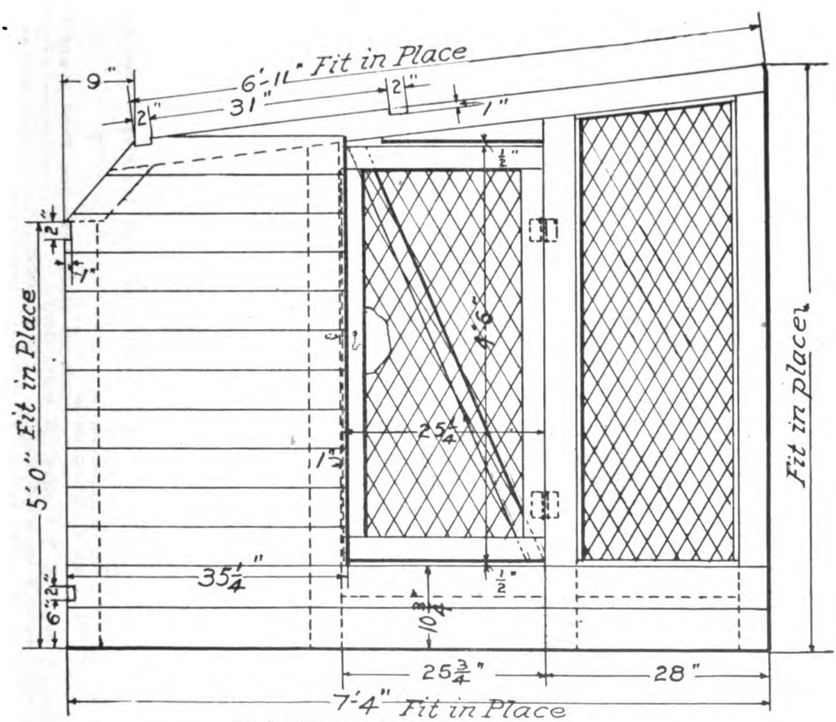
Rear View 8'-0"x10'-0" Fool Proof Poultry House
Showing Ventilator Door and top Ventilator.

Fig. 57.

Fig. 56. The interior arrangement here shown shows the relation of the roosts and their supports, nests, nest supports, feed bins and floor ventilator, when the middle partition is left out. The rear ventilator can be understood here to employ not only the rear ventilator door but the roof ventilator as well. This illustration will aid in starting the foundation and bottom members correctly so that an orderly process of construction may be had when following Nos. 50, 51 and 52, keeping No. 54 and No. 56 always together, so what is not understood from one illustration may be from the others. Note the floor ventilator in place. You can see that plaster or beaver board is used as ceiling back of the roosts and over same. Narrow strips of lumber are nailed over the joists and edges.

Fig. 57. Here the rear ventilator door is raised, showing the method of air passage to the outside, also the simple method of placing hooks to hold the door open so the wind in windy localities will not unhook it. The hook is in the rafter and the eye in the door. The King or Star metal ventilator is shown in place on the roof. Instructions are given for the sizes, making and installation of same in another place in this lesson.

Fig. 58. It is thought this partition could best be constructed as shown, then set up in the house, and further provide a partition easily to be removed or replaced should it be desired to do so, to make a two compartment house or a one compartment house at will. Otherwise the partition could be built in piece by piece into place making its removal impossible without tearing it to pieces.



Side Elevation of Partition
For 8'-0"x10'-0" Fool Proof Poultry House

Fig. 58.

We Recommend This Size House Only for City Lots or for Small Breeding Pens.

Materail for Fool-Proof Colony House 8 Feet Wide, 10 Feet Long, 7 Feet High at Front, 5 Feet High at Back

No.	NAME	No. of pieces	Sizes	Length	Kind of material	How Used, etc.	No. ft. per piece	Total feet	Remarks
2	Runners	2	2x8	12	Oak	Cut as sled runners	16	32	
2	Outside sills	2	2x4	10	Pine	Cut 10 ft. for side	6 2-3	13 1-3	
2	Outside end sills	1	2x4	16	Pine	Cut 2 ps. 7 ft. 8¾ in.	10 2-3	10 2-3	
5	Floor joist	3	2x4	16	Pine	Cut 5 ps. 7 ft. 8¾ in.	10 2-3	32	1 piece left over.
19	Flooring boards	19	1x6	10	Pine	.....	5	95	
4	Back studding	2	2x4	10	Pine	Cut 5 less thickness of plate	6 2-3	13 1-3	
7	Front studding	3	2x4	14	Pine	Cut 7 less thickness of plate	9 1-3	28	Now use left-over piece.
4	End studding	9	2x4	12	Pine	Cut to fit slope of rafter	8	16	
5	Rafters	5	2x4	10	Pine	.....	6 2-3	33 1-3	
2	Plates	2	2x4	10	Pine	Front and back	6 2-3	13 1-3	
2	Headers	1	2x4	10	Pine	Cut over and under ventilators	6 2-3	6 2-3	
7	Siding boards for front	7	1x6	10	Pine	Drop siding cut 12 ft.	5	35	
6	Siding boards for front	3	1x6	16	Pine	Drop siding cut in short pieces	8	24	
10	Short lengths for front	1	1x6	18	Pine	.....	9	9	Between window and corner and window and ventilator.
30	Siding boards	10	1x6	16	Pine	.....	8	80	
4	Siding boards for ends	2	1x6	16	Pine	.....	8	16	
13	Siding boards for back	13	1x6	10	Pine	.....	5	65	
18	Roof boards	18	1x6	12	Pine	.....	6	108	
1½	Squares rubberoid	.....	.....	.....	.....	3 ply	.....	.....	
8	Corner boards	4	1x4	14	Pine	.....	4 2-3	18 2-3	
2	Full windows	.....	.....	.....	.....	8 light, 10x12, per wdw. $1	.....	.....	
4	Window jambs, 2 heads	2	1x6	12	Pine	.....	6	12	
3	.....	3	1x4	10	Pine	Cut sides, casings and heads	3 1-3	10	
4	.....	1	1x6	12	Pine	Sills for windows and ventilators	6	6	
2	Ventilator frames	1	1x6	14	Pine	Cut to length, both frames	7	7	
16	Ventilator slats	3	1x4	12	Pine	.....	4	12	
1	Door of flooring	3	1x6	12	Pine	.....	6	18	
2	Facing boards	2	1x4	14	Pine	.....	3 1-3	9 2-3	
2	Facing boards	2	1x4	10	Pine	.....	3 1-3	6 2-3	

Bills of Nails for Fool-Proof Colony House, 8x10

3lbs. 16p. common nails
12 lbs. 8p. common nails
3 lbs. 6p. common nails
2 lbs. 8p. finish nails
1 lb. 6p. finish nails

Bill of Hardware for Fool-Proof Colony House, 8x10

1 pr. 5-in. T-hinges for main door
1 hasp 6-in. with staples for main door
1 pr. wrought butts, 2x2, for back ventilator
2 pr. wrought butts, 2x2, for small doors
2 pr. wrought butts, 2½x2, for top windows
8 hooks and eyes, 2-inch
4 spring window bolts for lower windows
10 ft. poultry netting, 1-inch mesh, 26 inches wide, for windows.

Fig. 59. This front elevation of the 8x10-foot house shows the correct arrangement of hinges for windows and exit doors as well as the means of holding windows open when used for ventilators; also the relative position of slatted ventilator and how to frame around the several openings to make them correctly without waste of material or needless labor. The outside covering of the house is shown to go entirely over the frame work from the ground up and make a rat proof arrangement.

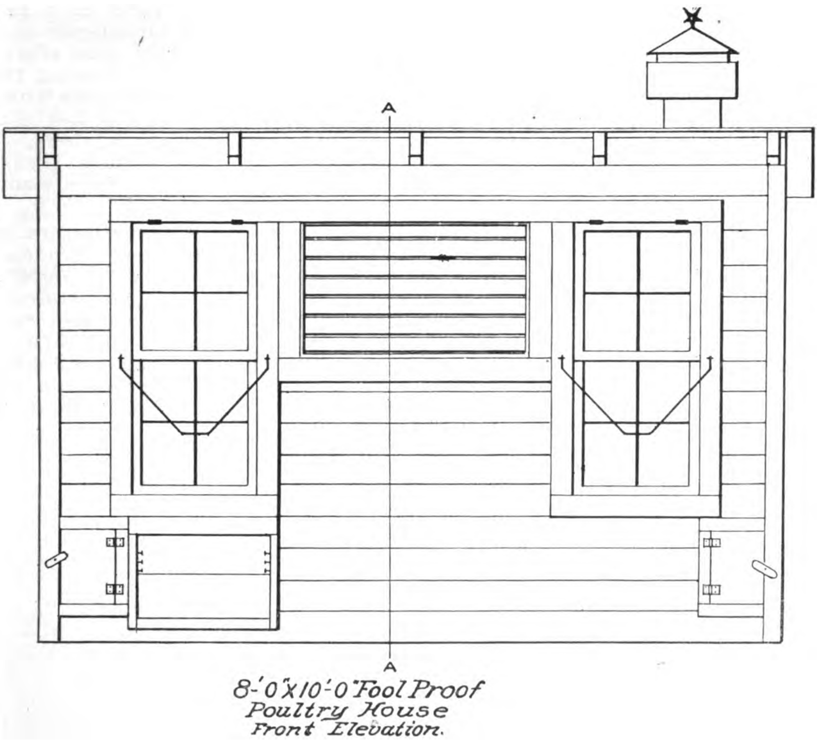


Fig. 59.

THE QUISENBERRY FOOL-PROOF LAYING HOUSE, 20x100 FT.

One common mistake on many commercial egg farms is that of keeping laying hens in too small flocks, thereby greatly increasing the expense of caring for the fowls. Labor is one of the most important items which must be taken into consideration if commercial poultry farms are to be made to pay a profit. Many large poultry farms have failed in the past because the amount of labor required in caring for the birds—feeding, watering, cleaning houses, gathering eggs, opening many doors and gates, carrying water to many small flocks of only a few birds each, and the great expense of keeping up numerous fences, etc., used with such systems robbed those farms of all their profits. With the fool-proof laying house and the system here recommended one man can easily care for 2,000, 3,000 or more laying hens. This house has solved the problem of labor, convenience and good health, and we heartily recommend its adoption to all who expect to establish commercial egg farms. This house is intended only for use where fowls are kept in large flocks and where they can be given plenty of range.

The fool-proof laying house here illustrated and described is one hundred feet long and twenty feet wide, eight feet high in front and five feet high in the rear. The arrangement of the windows and ventilators is exactly the same as in the fool-proof breeding house, except that each section is twenty feet long instead of fourteen feet.

On the interior of this house a solid board partition extends from the back wall to within four feet of the front. This leaves space of four feet between the partition and the front wall which is always open, thereby giving each hen access to a house 100x20 feet. This gives each hen more room and insures more exercise, more eggs, and a higher per cent of fertility. By having but few doors to open, by having the feed stored in the house in bins and hoppers in liberal quantities, and by having the water piped into the house the attendant can easily care for a large number of hens. In one such house you can easily keep 500 or 600 Leghorn hens or at least 500 Plymouth Rocks, Wyandottes, Orpingtons, Reds, or larger varieties. Sixteen-foot solid partitions must be used to every 20-foot section of this house, leaving a space of four feet free from doors or any obstruction.

The bins for grain can be placed beneath the front ventilators as in the fool-proof breeding house. The dry mash hoppers may be placed against the partitions, also the table for drinking pans, etc. Roosts, nests, droppings boards, rear ventilators and windows can be arranged as in the fool-proof breeding house. The general plan and construction of the house is exactly the same in both cases. If you do not care to keep as many laying hens as this house provides for, you can build two, three or four sections of this house, depending upon the number you expect to keep. We do not recommend that more than 500 or 600 hens

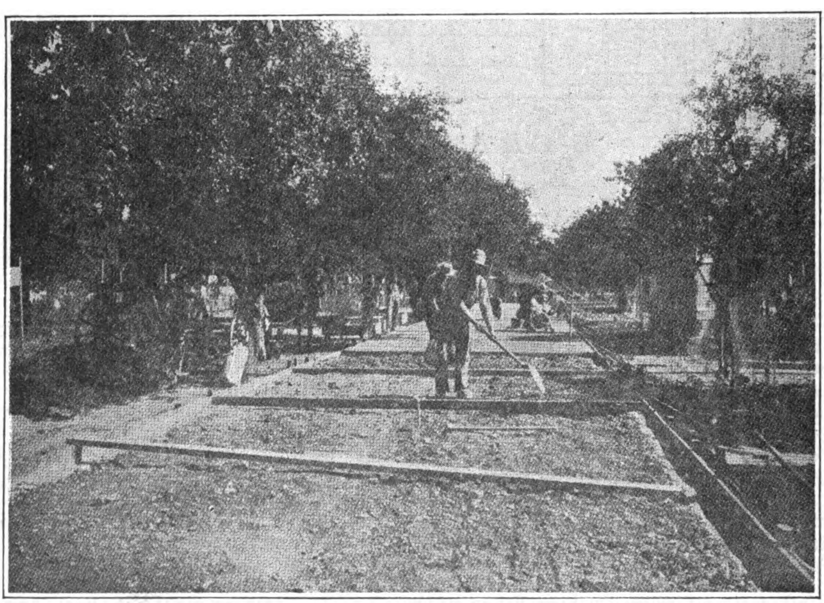


Fig. 60.—Tamping in cinders and rocks before the concrete is laid. The rocks and cinders are used for filler and drainage. Foundation and floor such as are used in the fool-proof laying house for 500 hens.

be kept in one house. If you desire to keep 2,000 laying hens, then build about four of these houses, allowing not less than two acres of ground to each house. More is to be preferred. If you keep 10,000 laying hens, use twenty of the fool-proof laying houses. The amount of yard space used for each house depends upon the nature of the soil surrounding same. We prefer sandy, well drained soil on which to locate houses for large flocks of layers. Avoid all the fencing possible. If the houses are placed a reasonable distance apart, the flocks will not mix, even if you have no fencing. Units of 500 laying hens kept in these fool-proof laying houses is another step which insures the success of more commercial egg farms if the other conditions are right.

Hardware Bill

50 lbs. 16d common nails
125 lbs. 8d common nails
20 lbs. 8d casing nails
15 lbs. 6d casing nails
10 lbs. 3d common nails
10 lbs. wire staples
4 pairs 1½x1½ in. wrought butts—for small doors
2 pairs 4-in. T hinges—for windos.
10 pairs 1½-in. wrought butts—for windows
8 pairs 2x2-in. wrought butts—for ventilators in back
30 spring window bolts—for windows
24 hooks and eyes, 2-in. long—for all openings
2 door clasps, 6-in.—for main doors.

We do not give prices or costs for the reason that these vary so greatly in different localities. Any estimates which we might make would be of little or no value for this reason.

If a board floor or a concrete floor is desired, you can easily determine the cost of such floor in your own community. We advise the use of some kind of a floor. If you use boards get the floor up off of the ground eighteen inches or two feet. If you use concrete, provide plenty of rocks, gravel and cinders under the floor for drainage.

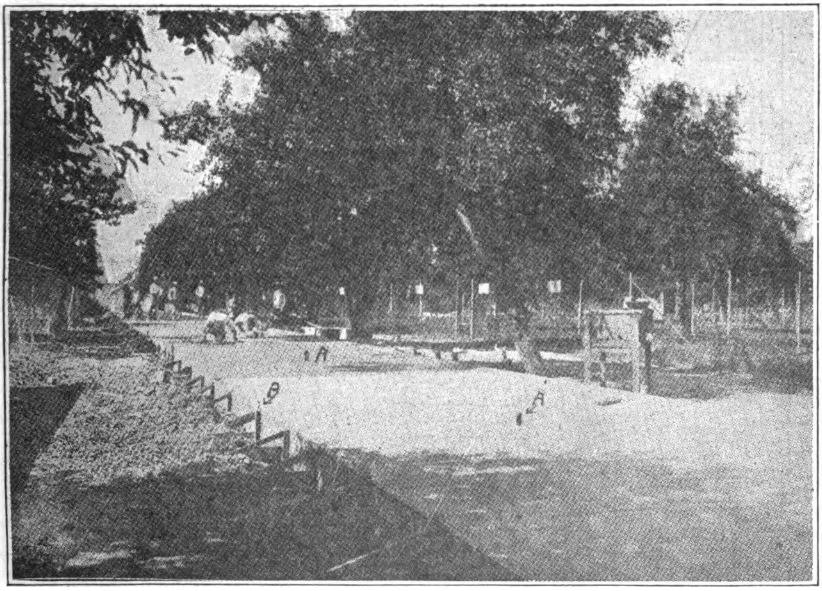


Fig. 61.—Completing the floor of a 100-ft. fool-proof laying house. A shows the water pipes. B shows the bolts placed in the concrete foundation to bolt the sill to the foundation.

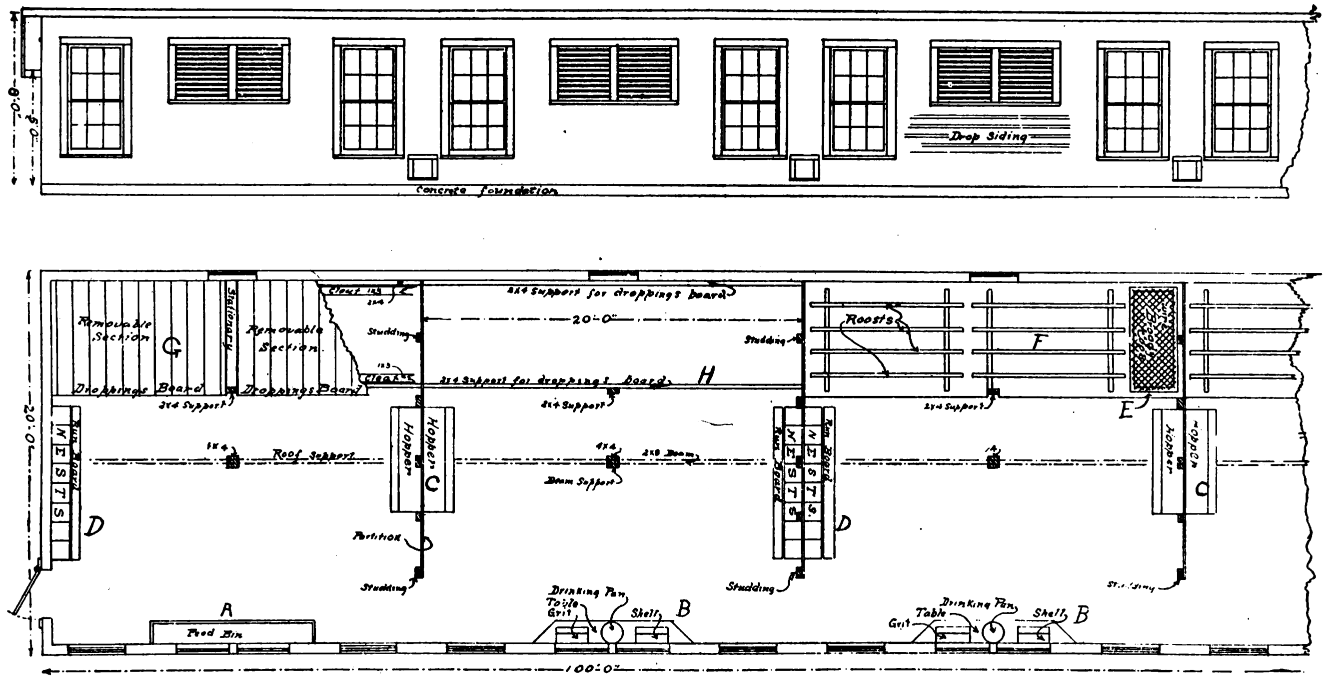


Fig. 62.—THE QUISENBERRY FOOL-PROOF LAYING HOUSE, 20x100 FEET

Floor plan and front elevation. A, feed storage bin; B, water pans, grit and shell hoppers; C, dry mash hoppers; D, wall nests; E, broody coop; F, roosts; G, droppings boards; H, location of nests which may be placed under the droppings boards. About every 40 to 60 feet there should be a solid partition in the house, the partition to contain a light swing door and also an opening for the fowls to pass through.

Bill of Material for Fool-Proof Laying House, 20 Feet Wide by 100 Feet Long

No.	NAME	No. of pieces	Sizes	Length	Kind of material	How Used, etc.	No. ft. per piece	Total feet
2	End sills	2	2x6	20	Pine	One for each end	20	40
2	Side sills	10	2x6	20	Pine	5 for each side	20	200
37	Front studding	19	2x4	18	Pine	For long studding, 1 piece cuts 2	12	228
10	Front studding	5	2x4	12	Pine	For short studding, 1 piece cuts 2	8	40
50	Back studding	25	2x4	12	Pine	Total studding for back	8	200
18	End studding	9	2x4	16	Pine	For both ends, 1 piece cuts 2	10 2-3	96
50	Rafters	50	2x6	22	Pine	Cut to fit plates	22	1100
2	Double plates	25	2x4	16	Pine	For front and back plates	10 2-3	266 2-3
1	Roof support	5	2x8	20	Pine	To support rafters	26 2-3	133 1-3
5	Beam support	5	4x4	10	Pine	Cut to fit under above roof support	13 1-3	66 2-3
20	Partition studs	10	2x4	16	Pine	1 piece cuts 2, cut to fit rafters	10 2-3	103 1-3
5	Droppings boards support	1	2x4	14	Pine	1 piece cuts 5, cut to fit rafters	9 1-3	9 1-3
35	Siding boards, "full"	35	1x6	14	Pine	Drop siding, No. 1 cut under windows 5 boards high drop siding	7	245
7	Siding boards	35	1x6	12	No. 1	Cut under ventilator, 7 bds. high, drop siding	6	210
80	Siding boards, short	20	1x6	12	No. 1	Cut between ventilators and windows	6	120
14	Siding boards, long, back	84	1x6	16	No. 1	Sides up the entire back side	8	672
54	Siding boards, both ends	54	1x6	14	No. 1	1½ pieces to the run	7	378
2	Flooring boards, doors	6	1x6	12	No. 1	Flooring cut 6 feet	6	36
10	Window frames	10	1x6	14	No. 1	Finish 1 piece cuts, jambs and heads	7	70
10	Window sills	7	2x8	14	No. 1	Cut sills for windows and ventilators	18 2-3	130 2-3
10	Ventilator frames	10	1x6	10	No. 1	Cut jambs and head jambs	5	50
140	Ventilator slats	35	½x4	10	No. 1	1 cuts 4 pieces	3 1-3	116 2-3
162	Roof boards	162	1x10	14	Pine	Cut to fit, 6 boards to run, 27 runs	11 2-3	1890
27	Roof boards	27	1x10	16	Pine	Cut to fit, 1 board to 1 run, 27 runs	13 1-3	360
1	Facia complete	11	1x4	14	Pine	To be cut to fit	4 2-3	51 1-3
10	Window casings	10	1x4	14	Pine	1 piece cuts all casing for each window	4 2-3	46 2-3
10	Ventilator casings	10	1x4	12	Pine	1 piece cuts all casings for each ventilator	4 2-3	46 2-3
221	Squares rubberoid	.....	.....	.....	.....	.....	.....	.....
10	Supports for droppings boards	10	2x4	20	Pine	Cuts 20 feet to fit between partitions	13 1-3	133 1-3
10	Windows, 12 light	.....	.....	.....	.....	10x16 glass measure	.....	.....
5	Half windows, or sash	.....	.....	.....	.....	4-lights to each sash 12x14 glass measure	.....	.....
5	Frames for above	5	1x6	12	Pine	Cut all jambs except sill, sills given above	6	30
20	Cleats for droppings bds.	20	1x3	10	Pine	.....	2 1-2	50
110	Droppings boards	55	½x10	12	Pine	Cut six (6) feet long	8 1-3	458 1-3
20	Roosts supports	10	2x6	10	Pine	Cut 5 feet long	10	100
40	Roost poles	20	1x2	16	Pine	Cut 8 feet long	5 1-3	106 2-3
5	Broody coop frames	10	2x2	16	Pine	Cut 2 pieces to each frame	5 1-3	53 1-3
80	Partition boards	80	1x6	16	Pine	Sheathing No. 2	8	640
8	Corner boards	4	1x4	16	Pine	Each piece cuts 1 corner board	5 1-3	21 1-3
130	Lining boards	130	1x6	16	Pine	At the back and over the roosts	8	1040

Fig. 63.—Shows an 180-ft. combination fool-proof laying and breeding house which has just been completed at the Missouri State Poultry Experiment Station. An elevated concrete walk being constructed in front and hens pass into yards underneath.

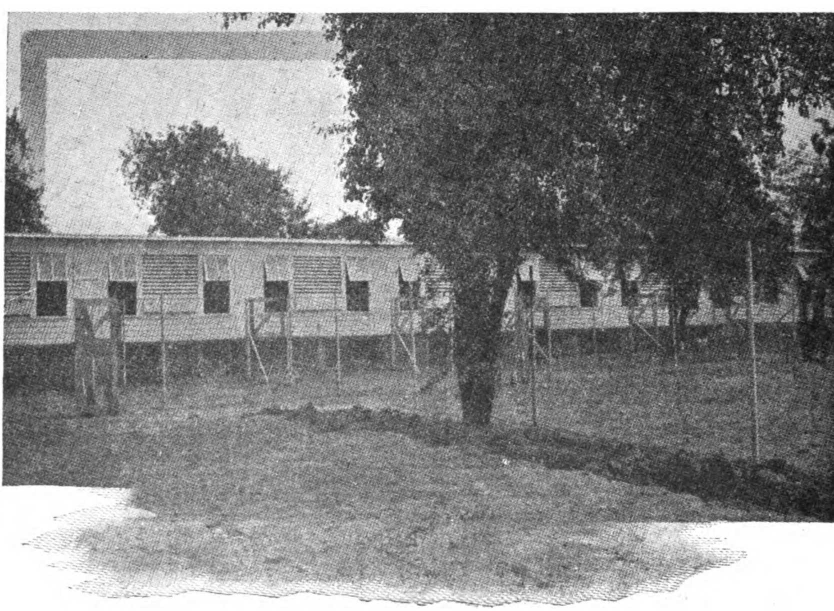


Fig. 64.—Quisenberry 180-ft. fool-proof laying and breeding concrete house. Also shows the forms in front which are supporting the elevated walk. These forms will be removed and yards made in front so that the hens can pass underneath the walk into the yards.

FOOL-PROOF HOUSE 14x14 FEET

Fig. 65. Before starting this building, supply your tool kit with a good spirit level which should be used in leveling up the horizontal, as well as the perpendicular members. This illustration places the observer in a position to look east when the house faces the south and shows all the frame members in place. The foundation having been constructed from the foundation drawing, will carry foundation bolts by which the nailing pieces of 2x4-inch members are placed and bolted down; on top of which the upright members of the entire house are nailed. The west and east ends being placed after the south and north sides are set up and held in place by the roof supports. The four corner members with the top stringer nailed in place are raised in pairs and the end roof rafters nailed to them, with temporary augling braces nailed to them at eight places or two in two directions at all corners, whereupon the

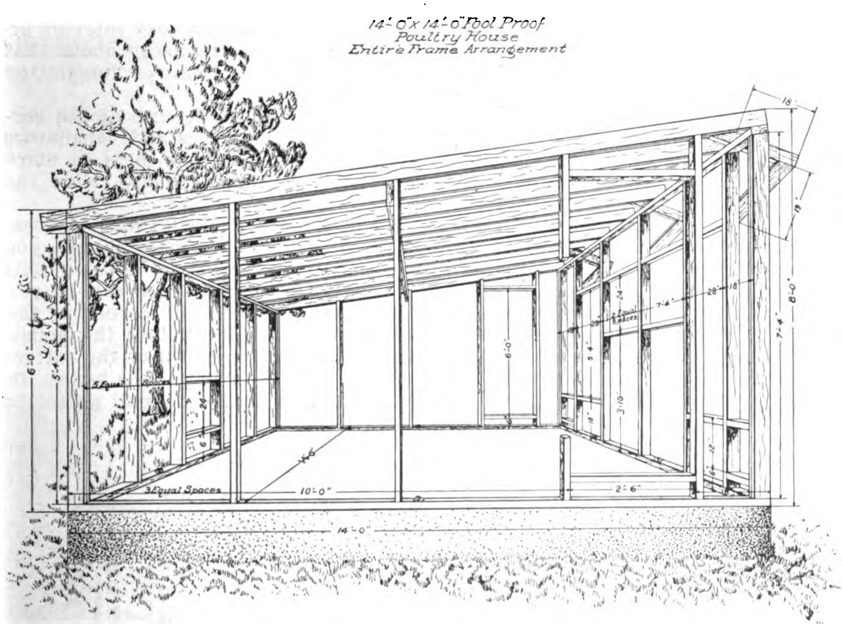


Fig. 65.

remaining uprights of the side, as well as the ends, are placed and nailed. The cross members for windows, doors and ventilators may be put in afterwards since there is room to swing a hammer in all places except the cross piece at the top of each exit door, which is toe-nailed into place. The short 18-inch overhanging front is supported by 2x4-inch pieces attached to the stringers over the front uprights and nailed side to side to the uprights as shown, and slant downward about 6 inches in the 18-inch of their length. All windows operate between the 2x4-inch upright and need no box framing, but if made with box framing, the 2x4-inch members, must be spaced to suit and ventilator space be reduced sufficiently to accommodate the boxed windows. The rear ventilator may be built in either before or after the siding is nailed on and the rear ventilator door may be placed before siding is attached since the siding will have to be framed in, or cut to fit, either around the door or after it is in place or before. The advantage of placing the door first is because you may place the edge of one siding board to suit the door and have just one board less to cut and fit.

Fig. 66. To clearly set before the student what is a 14x14 house without a partition will be when finished, is the purpose of this illustration, all in such manner that he may decide for himself his mode of procedure, as well as provide for all features in a group, and if employing more than one person to construct it, to allow the making of roosts, nests, feed hoppers, feed bins, and floor ventilators to one, while the other may go ahead with the house. This leaves all parts ready to set and attach in place when the framing has been proceeded to a point where they can be so set. Since material available in different localities will vary, certain features may have to be allowed as one goes ahead. For example, the droppings board, having been decided upon as 30 inches above the floor and the support as shown under the side toward the center of the floor is made of 2x6-inch, 2x8-inch or 1x10-inch board, the top of the nests must be lowered so they can be removed for cleaning and the table on which the nests are to rest must be level. Hence, a picture showing these several features is provided that essential features may be set and others made to suit. While this is a very satisfactory interior arrangement as we have shown it, yet there is nothing compulsory about that feature of any of our houses. But you must follow our plan of ventilation and construction if you want satisfactory results.

Fig. 67. This outside perspective is simply to show the use of the corner finishing boards and framing around the windows, doors and ventilators all in such clearness that one may account for them and put them in place with orderly arrangement and procure a neat well-made house. Note the shutters, roof and floor ventilators.

Fig. 68. This house is the same as our Improved Fool Proof Houses. Can be built in any dimensions up to 20 feet square. The only change you will notice is the fact that the exits are in the center of the house. This particular house has a partition in the center. The yard fence can be run to the center of the house which will throw each exit in the corner of the yard. This makes it easy for one person to drive the flock into the house. The front of the roof can be built with the drop front as shown or the rafters may be extended from eight to twelve inches beyond the front of the house. In case you use the drop front as shown it is advisable to use a small gutter to

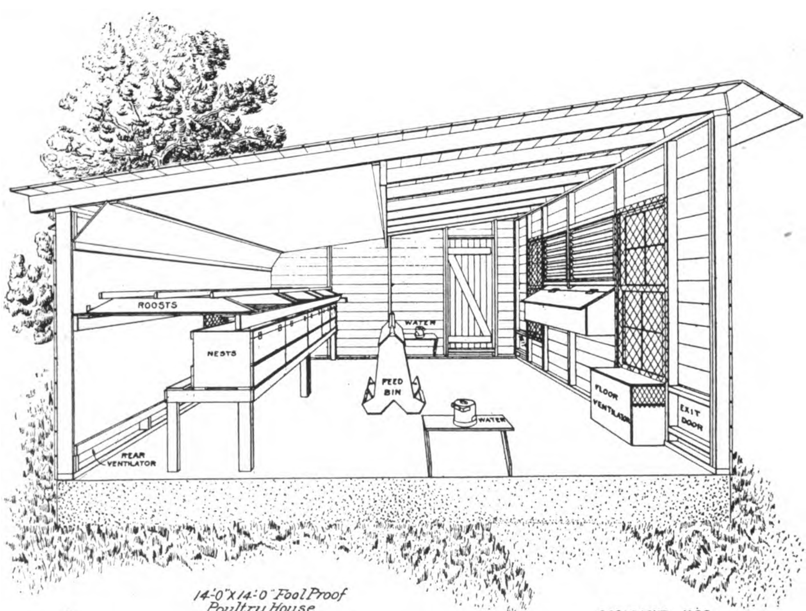
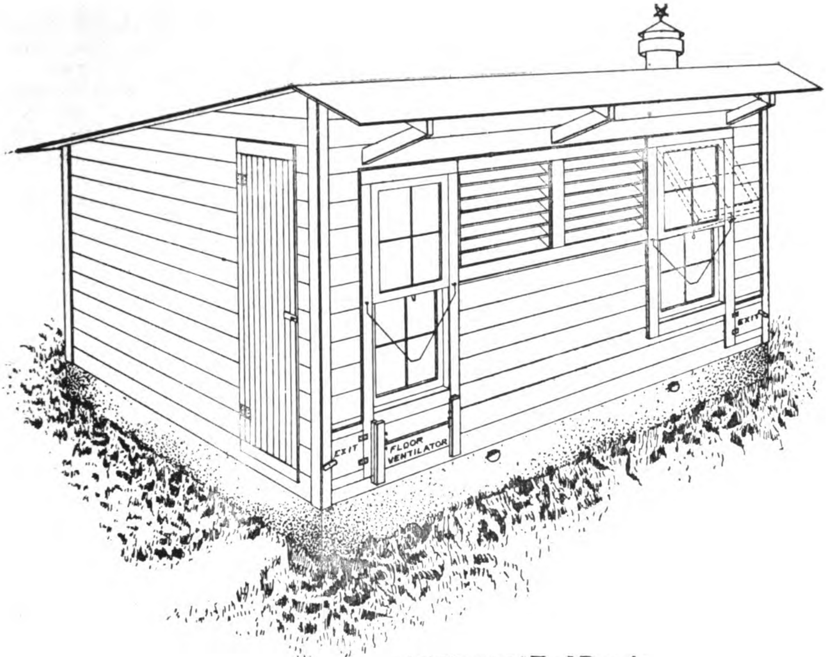


Fig. 66.



14'-0" x 14-0" Fool Proof
Poultry House.
External Front and End Arrangement

Fig. 67.

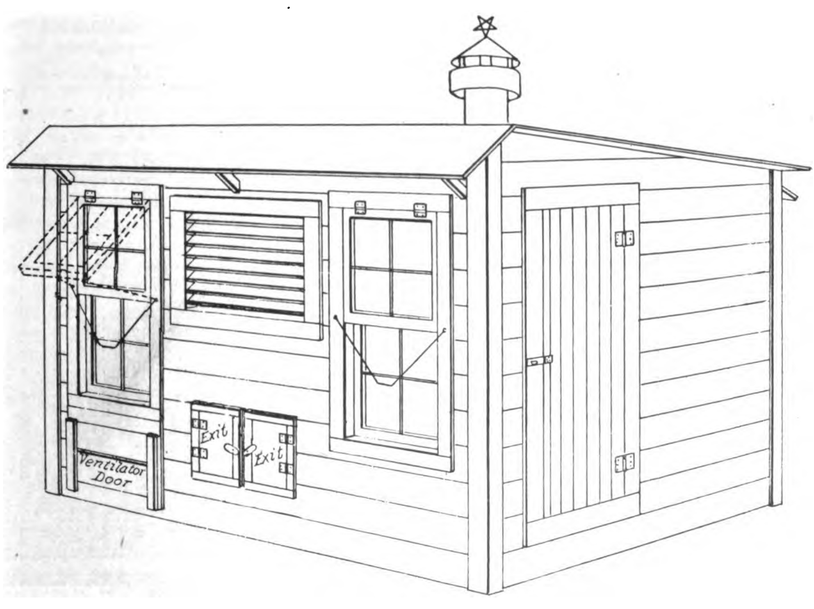


Fig. 68.

Bill of Material for a Fool-Proof Poultry House, 14 Ft. Wide, 14 Ft. Long, 8 Ft. High in Front, 6 Ft. in Back

No.	NAME	No. of pieces	Sizes	Length	Kind of material	How Used, etc.	No. ft. per piece	Total feet	Remarks
1	Front sill	1	2x6	14	Pine		14	14	
1	Back sill	1	2x6	14	Pine		14	14	
2	End sill	2	2x6	14	Pine	Box sills	14	28	
2	1 for each end	2	2x4	14	Pine		9 1-3	18 2-3	
9	Front studding	5	2x4	16	Pine		10 2-3	53 1-3	1 each end
8	Back Studding	4	2x4	12	Pine		8	32	
1	Front plate	1	2x4	14	Pine		9 1-3	9 1-3	
1	Back plate	1	2x4	14	Pine		9 1-3	9 1-3	
10	End studding	5	2x4	14	Pine		9 1-3	46 2-3	
8	Rafters	8	2x4	16	Pine		10 1-3	85 1-3	
1	Center supporter	1	2x4	14	Pine		9 1-3	9 1-3	
1	Post for same	1	2x4	8	Pine		5 1-3	5 1-3	
4	Siding lengths	7	1x6	14	Pine	Front siding (drop)	7	49	5 boards under window,
7	Siding	7	1x6	14	Pine	Front siding (drop)	7	49	2 above.
2	End siding	4	1x6	14	Pine		7	28	2 for each end under door.
16	Siding lengths	32	1x6	12	Pine	End siding	6	192	16 boards to the end.
7	Siding lengths	14	1x6	14	Pine	Back siding	7	98	
2	Back ventilator boards	6	1x8	14	Pine	Shiplap	9 1-3	9 1-3	
23	Inside lining lengths	23	1x6	14	Pine	Flooring	7	111	**HARDWARE**
27	Roof sheeting	27	1x8	16	Pine	Shiplap	10 1-3	289	**Bill of Nails**
...	Rubberoid roofing	3	......	......	......		......	......	4 lbs. 16p. common nails.
2	Outside door frames	2	1x6	16	Pine		8	16	14 lbs. 8p. common nails.
2	Outside door casings	2	1x4	16	Pine		5 1-3	10 2-3	4 lbs. 6p. common nails.
2	Outside door sills	2	2x8	8	Pine	Cuts both sills	10 2-3	10 2-3	2 lbs. 8p. finish nails.
2	Front window frames	2	1x6	14	Pine		7	14	1 lb. 6p. finish nails.
2	Front window sills	1	2x6	6	Pine	Cuts two sills	6	6	1 lb. 3p. common nails.
2	Front window casing	2	1x4	14	Pine	Cuts sides and head	4 2-3	9 1-3	**Bill of Hardware**
2	Back window frames	1	1x6	16	Pine	Cuts jambs, head and sills	8	8	2 pr. 5-in. T-hinges for main doors.
1	Back casing	1	1x4	12	Pine	Cuts sides and head	4	4	2 hooks and staples for
2	Front ventilator frames	2	1x4	12	Pine		4	8	same.
22	Ventilator slats	4	1x5½	14	Pine		7	28	3 prs. wrought butts, 2x2, for
2	Ventilator casing	2	1x4	10	Pine		3 1-3	6 2-3	back ventilator.
1	Facing all around	4	1x4	16	Pine		5 1-3	21 1-3	2 prs. wrought butts, 2x2, for
8	Corner boards	4	1x4	16	Pine		5 1-3	21 1-3	small back doors.
21	Shiplaps for droppings boards	7	1x8	16	Pine		10 2-3	74 2-3	2 prs. wrought butts, 2½x2, for top sash.
1	Droppings board support	1	2x4	14	Pine		9 1-3	9 1-3	4 spring window bolts for
1	Back supporter	1	1x2	14	Pine	Nail to wall	2 1-3	2 1-3	lower sash.
3	Roost pole supports	1	2x6	12	Pine		12	12	15 ft. of poultry netting, 1-in.
8	Roost poles	4	1x2	14	Pine		4 2-3	18 2-3	mesh, 28-in. wide windows.
33	Flooring boards	33	1x6	14	Pine		7	231	¾ doz. hooks and eyes.
6	For joists	6	2x6	14	Pine		14	84	
2	Full windows	......	......	......	......	8 lights 10x14	Per	W.	
1	Half window, back	......	......	......	......	4 lights 10x12	Per	½ W.	

carry off rain or melting snow to prevent it from blowing into the windows. Do this if you have any trouble along this line. We prefer the drop front to the straight rafter or roof if you can keep the water from blowing back into your house and causing the litter to become damp.

Fig. 69. Here the position and size of the rear ventilator door and window as well as the roof ventilator are shown together with the floor drying vent that the foundation carries. This rear ventilator door opens to but three spaces between the rear wall members while to lengthen the door all five spaces may draw the air through the rear opening.

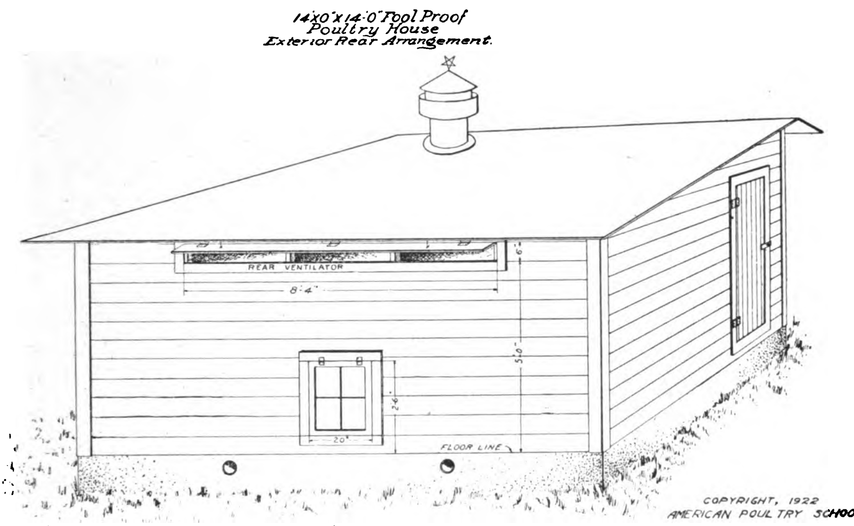


Fig. 69.

THE QUISENBERRY FOOL-PROOF COLONY HOUSE, 8x12 FT.

Certainly every poultry farm and every farmer should have one or more of these small colony houses. They are built on 2x8 oak runners, and each house is twelve feet long, eight feet deep, seven feet high in front and five feet high in the rear. The arrangement of windows and ventilators is the same as in the larger fool-proof breeding house, except that each is smaller in size and there is no window in the rear of the house. We do use a six-inch ventilator underneath the eaves, however, in summer months only. These houses are of such size that they can be pulled about the farm, to the orchard, the cornfield, or some convenient spot of ground, by hitching a team to them. We use a good tight board floor and the same sort of roof as described in the previous houses. The walls must be built of some good matched lumber. If the houses are intended to be used for brooding chicks in winter months, it is a good idea to line the walls with composition roofing and also put in a double floor. Otherwise, a single wall and a single floor will answer every purpose.

A partition two feet high, so it can be easily stepped over, can be put through the center of this house and a movable hover placed on either side, for brooding young chicks as soon as they are removed from the incubator after hatching. You can easily put fifty to seventy-five chicks under each hover, making 100 to 150 chicks to each house. After the chicks are old enough to do without heat we remove the hovers and partitions and store these away, putting in temporary roosts and droppings boards. This house is then occupied by the chicks until they are fully matured. We can also keep fifteen to twenty-five pullets or laying hens in one of these houses in winter months. For the next season's brooding the roosts are removed and stored, and the hovers and parti-

tions replaced. Thus the fool-proof colony house can be used the year around. We know of no better method of raising incubator chicks than here described. The chicks can be started in the colony house as soon as they are hatched. It makes a good house later for the growing stock.

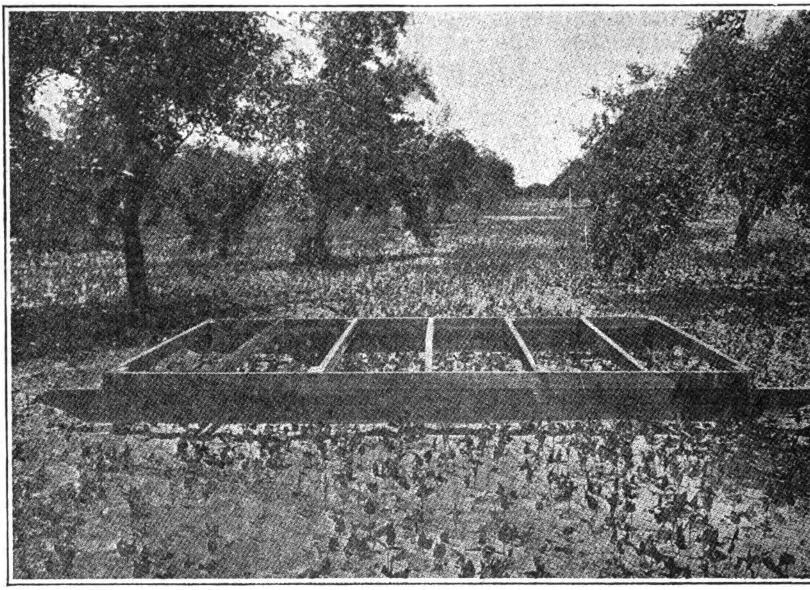


Fig. 70.—This illustrates the method of attaching the 2x8 oak runners to the frame for the floor. Notice that the runners are securely braced to the joists.

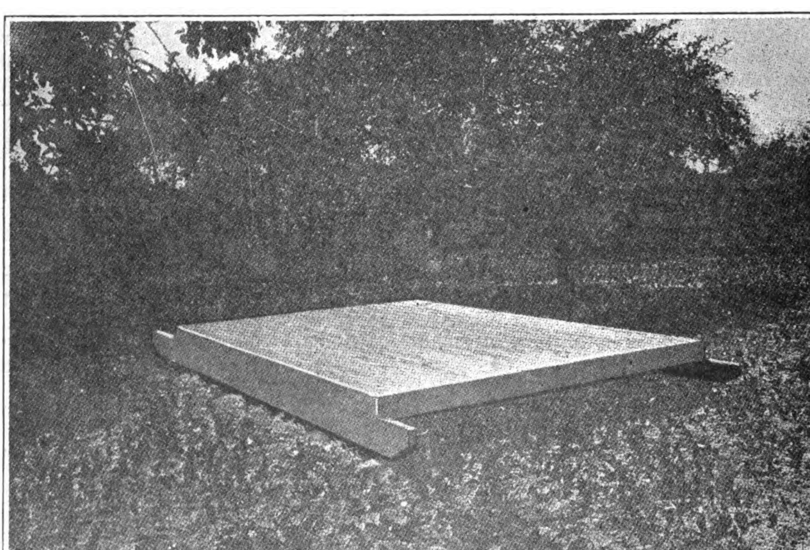


Fig. 71.—The floor is securely nailed to the joists, and this then makes a good foundation for your colony house. A double floor may be laid if you expect to use the house for brooding young chicks in winter.

Then in winter it can be used for a few layers or breeders. It is very cheap, costing but little more than a good brooder, and it can be used the year around, instead of simply during the hatching season. Any

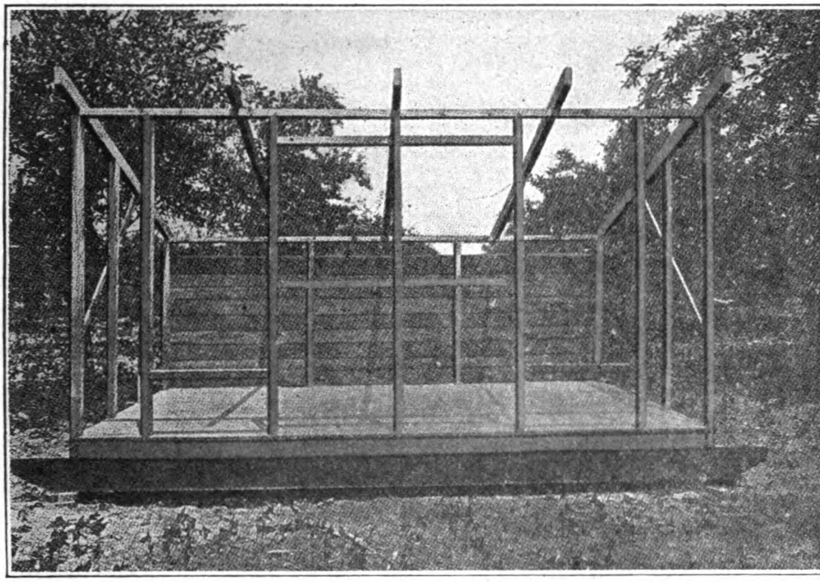


Fig. 72.—Shows the construction of the frame ready for the siding.

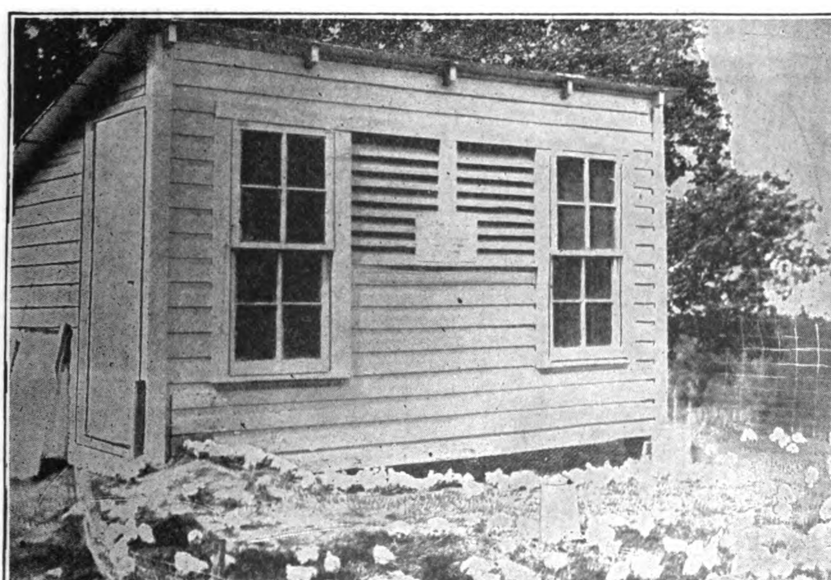


Fig. 73.—A completed fool-proof colony house. One of the most useful and convenient buildings about the poultry yards. This shows the ventilator in place. Four hundred chicks are being brooded in this house. You can see the chicks being confined to the front of the house by a temporary wire fence.

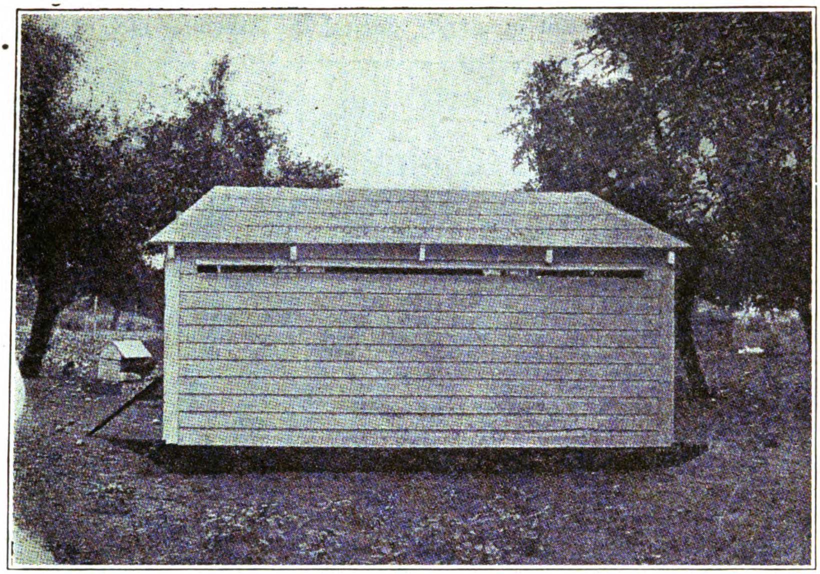


Fig. 74.—A rear view of the Quisenberry fool-proof colony house. Shows the ventilator open in the rear. This makes the house much cooler in summer. This must be closed and made tight in winter.

Fig. 75.

The Fool-Proof Colony Houses as used in the National Egg-Laying Contest.

farmer or farm hand who can use a hammer and saw can build one of these simple houses in a short while. You will find them a great convenience. It is the general concensus of opinion of those who have tried them that there is no better proportioned, better ventilated or more satisfactory colony house in existence than the Quisenberry Fool-Proof Colony House.

When we first place the baby chicks under the hovers in this house we confine them to the house for two or three days, or longer if necessary, until the chicks learn to eat and drink and know the way to and from the hover. We also cover the floor with a fine straw litter or clover chaff and sprinkle a little sand or grit upon the floor. When we decide to let them see a little of the outside world, we drive down a few stakes and place a few feet of one or two-foot poultry netting, one-inch mesh, around a small space in front of the house. This gives them a little yard to use for a few days only, until they learn the way in and out of the house. Then the little temporary fence is removed, the chicks have free range and come back here to roost at night and for protection from the storms.

There is no better place to keep a few of these houses than in a cornfield or in a patch of sweet corn near the orchard or garden. The corn furnishes plenty of shade, and the poultry find lots of bugs and worms, besides having clean fresh ground over which to run. The young stock in a cornfield grows strong, husky and vigorous. You can put a lustre on their plumage and get a growth here that you can get in no other way. One or more fool-proof colony houses will prove a good investment for any poultry raiser or farmer.

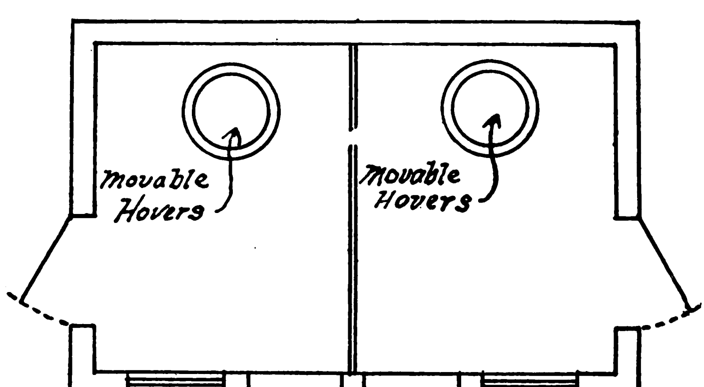


Fig. 76.

This shows the partition in the center of the house and movable hovers used on each side for brooding young chicks. Three such hovers could be used in this house.

No.	NAME	No. of pieces	Sizes	Length	Kind of material	How Used, etc.	No. ft. per piece	Total feet	Remarks
2	Runners	2	2x8	14	Oak	Cut as sled runners.	18 2-3	37 1-3	
2	Outside sills............	2	2x4	12	Pine	Cut 12 ft. for slide..	8	16	
2	Outside end sills.........	1	2x4	16	Pine	Cut 2 ps. 7 ft. 8¾ in.	10 2-3	10 2-3	
5	Floor joist	3	2x4	16	Pine	Cut 5 ps. 7 ft. 8¾ in.	10 2-3	32	1 piece left over.
19	Flooring boards	19	1x6	12	Pine	....	6	114	
4	Back studding	2	2x4	10	Pine	Cut 5 less thickness of plate	6 2-3	13 1-3	
7	Front studding	3	2x4	14	Pine	Cut 7 less thickness of plate	9 1-3	28	Now use left over piece.
4	End studding...........	9	2x4	12	Pine	Cut to fit slope of rafter.	8	16	
5	Rafters	5	2x4	10	Pine	....	6 2-3	33 1-3	
2	Plates	2	2x4	12	Pine	Front and back.....	8	16	
2	Headers	1	2x4	10	Pine	Cut over and under ventilators.	6 2-3	6 2-3	
7	Siding boards for front.	7	1x6	12	Pine	Drop siding cut 12 ft.	6	42	
6	Siding boards for front.	3	1x6	16	Pine	Drop siding cut in short pieces.	8	24	
10	Short lengths for front..	1	1x6	18	Pine	....	9	9	Between window and corner and window and ventilator.
30	Siding boards	10	1x6	16	Pine	....	8	80	
4	Siding boards for ends..	2	1x6	16	Pine	....	8	16	
13	Siding boards for back..	13	1x6	12	Pine	....	6	78	
18	Roof boards	18	1x6	14	Pine	....	7	126	
1½	Squares rubberoid	......	......	....	......	3 ply.	......	......	
8	Corner boards	4	1x4	14	Pine	....	4 2-3	18 2-3	
2	Full windows	......	......	....	......	8 light, 10x12, per window, $1	......	......	
4	Window jambs, 2 heads.	2	1x6	12	Pine	....	6	12	
3	Casings and heads......	3	1x4	10	Pine	Cut sides, casings and heads	3 1-3	10	
4	Window sills.	1	1x6	12	Pine	Sills for windows and ventilators ...	6	6	
2	Ventilator frames	1	1x6	14	Pine	Cut to length, both frames.	7	7	
16	Ventilator slats	3	1x4	12	Pine	....	4	12	
1	Door of flooring........	3	1x6	12	Pine	....	6	18	
2	Facing boards	2	1x4	14	Pine	....	3 1-3	9 2-3	
2	Facing boards	2	1x4	10	Pine	....	3 1-3	6 2-3	

Bills of Nails for Fool-Proof Colony House, 8x12

3 lbs. 16p. common nails
12 lbs. 8p. common nails
3 lbs. 6p. common nails
2 lbs. 8p. finish nails
1 lb. 6p. finish nails

Bill of Hardware for Fool-Proof Colony House, 8x12

1 pair 5-inch T-hinges for main door
1 hasp 6-in. with staples for main door
1 pair wrought butts, 2x2 for back ventilator
2 pair wrought butts, 2x2 for small doors
2pr. wrought butts, 2½x2 for top windows
8 hooks and eyes, 2-inch
4 spring window bolts for lower windows
10 ft. poultry netting, 1-inch mesh, 26 inches wide for windows

FOOL-PROOF HOUSE FOR 1,000 HENS, 48x60 FT.

If you wish to keep a large flock of hens in one house, one of the most satisfactory plans that we have ever used is the house illustrated and described below. These houses can be built more economically than the long, narrow houses of continuous units. A house like this, 48 feet deep by 60 feet in width or length, makes the house more economical in construc-

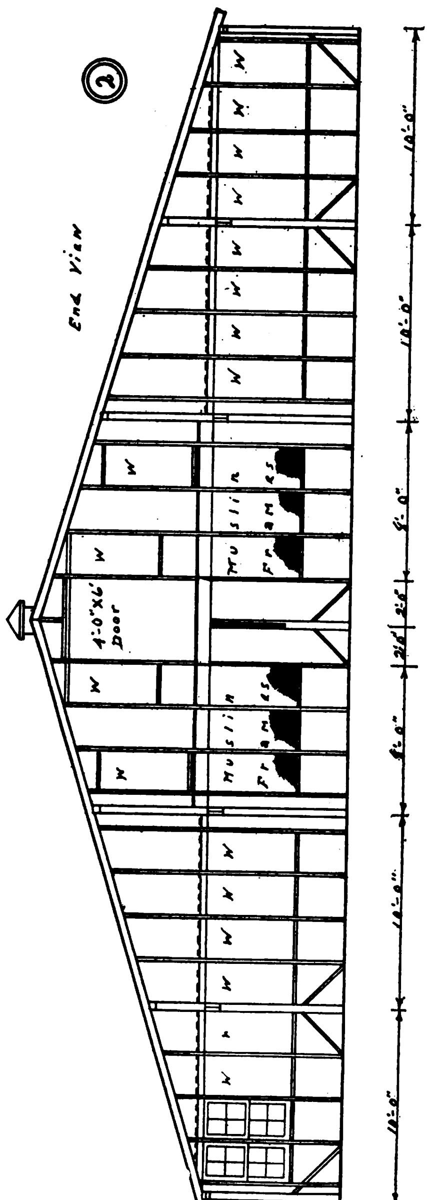


Fig. 78.

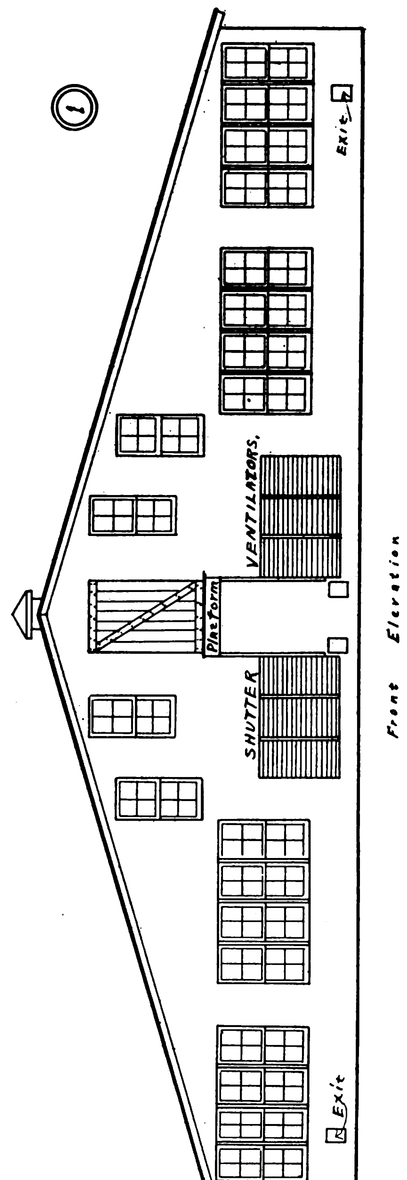


Fig. 77.

tion and requires less labor in caring for large flocks. In a house of this kind laying hens can be confined for the greater portion of the year, but they usually have better health if permitted to have a reasonable amount of range. The second story of this house has a solid board floor through the center one-third, which is used for grain bins, a mixing room and for storage purposes. The remaining one-third of the floor on each side of the center section is covered by poultry netting, or by light boards, and these are covered with from four to six inches of straw. If boards are used to support the straw there should be about a two-inch space between each board, so that air can pass from the first floor and roosting room up through the straw and out the ventilator in the top of the roof. This permits the air to come in through the shutter ventilators in the front of the house, and, also, through the ventilator that is shown beneath the floor from one end of the house to the other. This gives a perfect circulation of air through the house both winter and summer without a direct draft on the fowls at any time.

SPECIFICATIONS ON HOUSE, 48x60 FT.

The charts are numbered from one to five. Fig. 77 illustrates the south end of house boarded up and the Fool-Proof slatted ventilators in place one foot above the floor. Make the ventilators 4½ feet high by two feet wide and six in number. These vents are for "constant ventilation," while the windows serve as auxiliary ventilators. These slatted ventilators are placed in the center of the house where they admit air equally to both units and do not permit draft on either side. This shows the floor elevation with the exits for the fowls; also, the windows in the front section of the house. A door is shown in the upper story, and in front of this door there is an elevated platform where feed, straw, etc., can be conveniently handled when placed in the second story. This figure shows the windows in the second story, which admit light and ventilation. One of the galvanized ventilators is shown, also, in the roof of the house. On the interior of these shutter ventilators there should be a frame, hinged at the top, and this frame should be covered with a burlap or muslin curtain. When the weather is extremely cold, or if this house is used in a climate where the weather is extreme, then we would advise raising and lowering this curtain as the weather requires. The curtain frame should cover the space occupied by the shutter ventilator.

Fig. No. 78 illustrates the same house with muslin frames in place of the slatted ventilators. However, these are not placed one foot from the floor, but are placed in the identical position with the sash. These muslin frames swing in at the bottom and are hinged directly onto the 2x4, close to the ceiling, so that when they are swung in there is left no room between them and the ceiling for birds to lay and roost. The 4x4 unloading platform occupies the space in between these six muslin frames. This gives you an idea as to the construction of the frame work of the house. You will note that the 4x4 posts run from the foundation or floor to the rafter of the roof which they support. These 4x4 posts or supports are spaced 10 feet apart. You will note the light, narrow lumber used to support the straw on each side of this center space. We would recommend the use of 2x8-inch joists underneath the floor through the center of the house. You will no doubt have more or less grain in the bins, and more or less straw and material stored in this center section. Two-by-four-inch joists beneath the straw loft on each side would really be sufficient to support the straw and hold the building together.

Fig. No. 79 is the floor plan of lower floor showing the location of droppings boards, with nests underneath. Also, location of large double two-story dry mash hopper in the center of the partition, thus accommodating the birds on both sides of the partition. Directly under the floor underneath the droppings boards has been constructed a large "air inlet tube," 12 inches in diameter, extending out into the open air on both sides of the house. From this, on the inside of the house, and directly back of each 4x4 post supporting upper story, is then placed an 8x8 ventilator reaching to within 12 or 14 inches of the droppings boards for the admission of fresh air. This outside air inlet is also illustrated in Fig. No.

80. If you do not care to have a partition in the house, this is not necessary and the fowls can be permitted to run from one side to the other. Instead of having platforms "B" where they are located, they might be changed to location "A." In that case you could have water pipes running to the house and drinking pens on the platforms at location "A." The large double, two-story, dry mash hopper is marked "C" and is in the center of the house. "D" represents two double tiers of nests, with broody coops built on top of the nests. These can be increased as the flock demands.

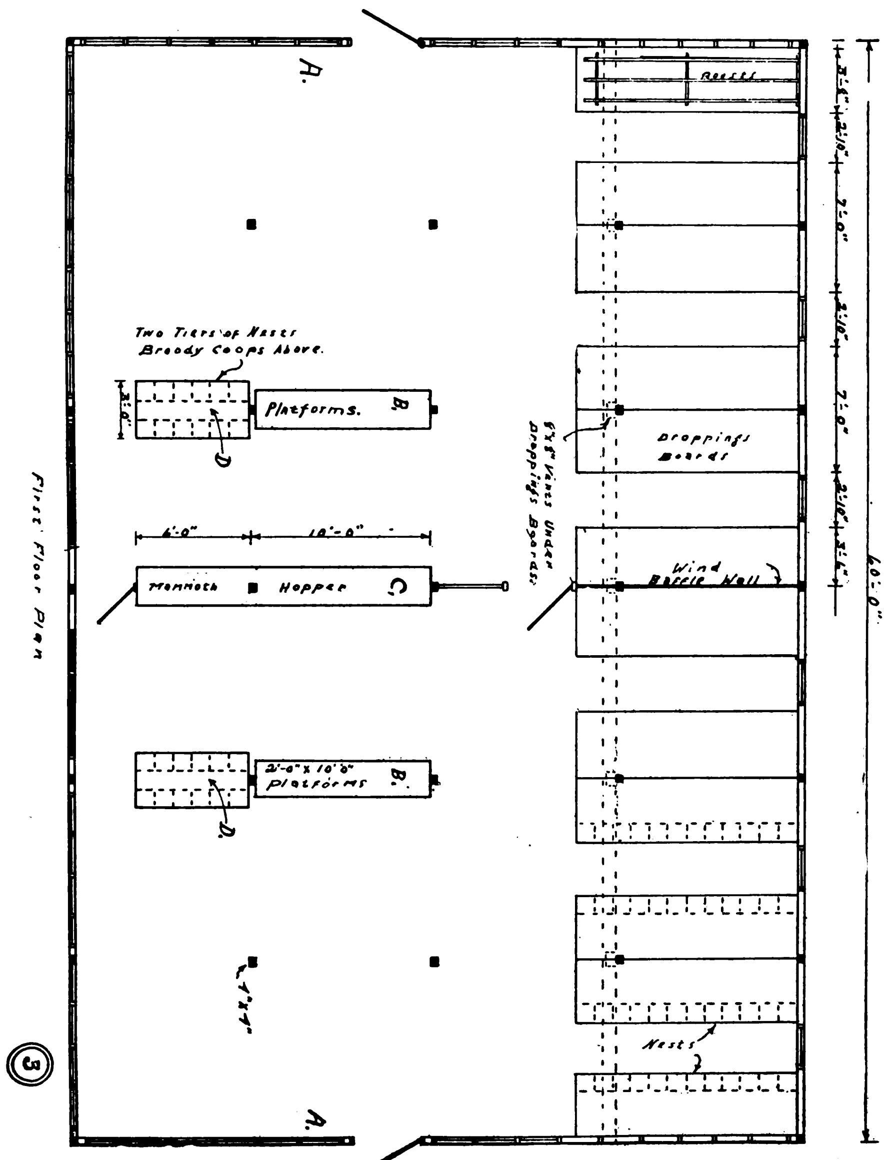
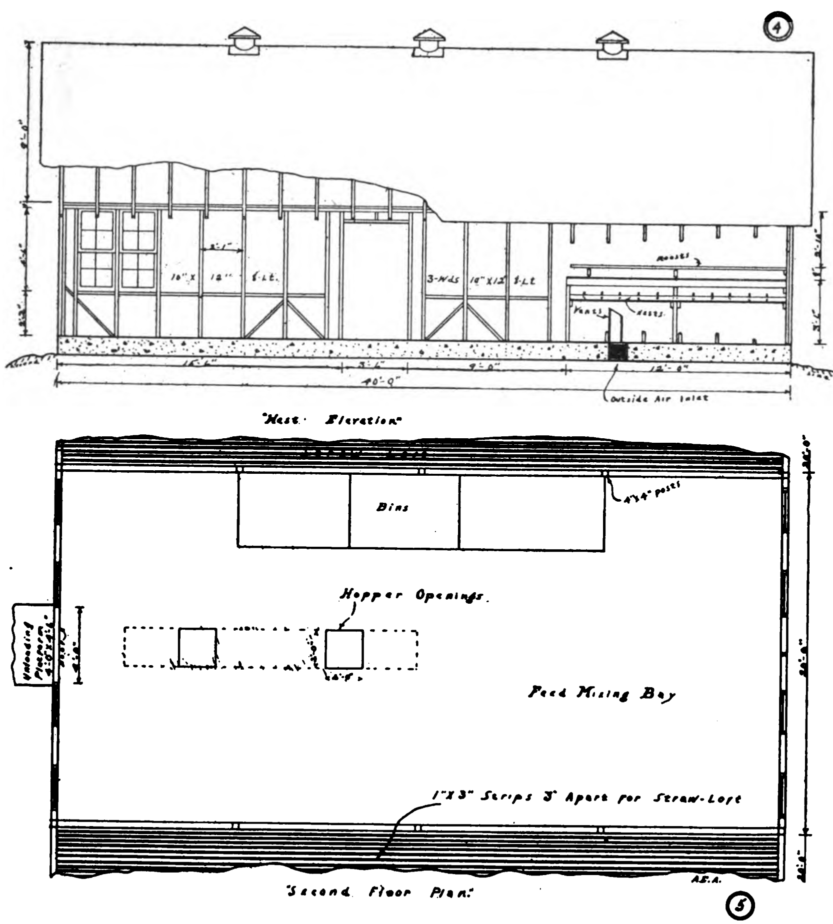


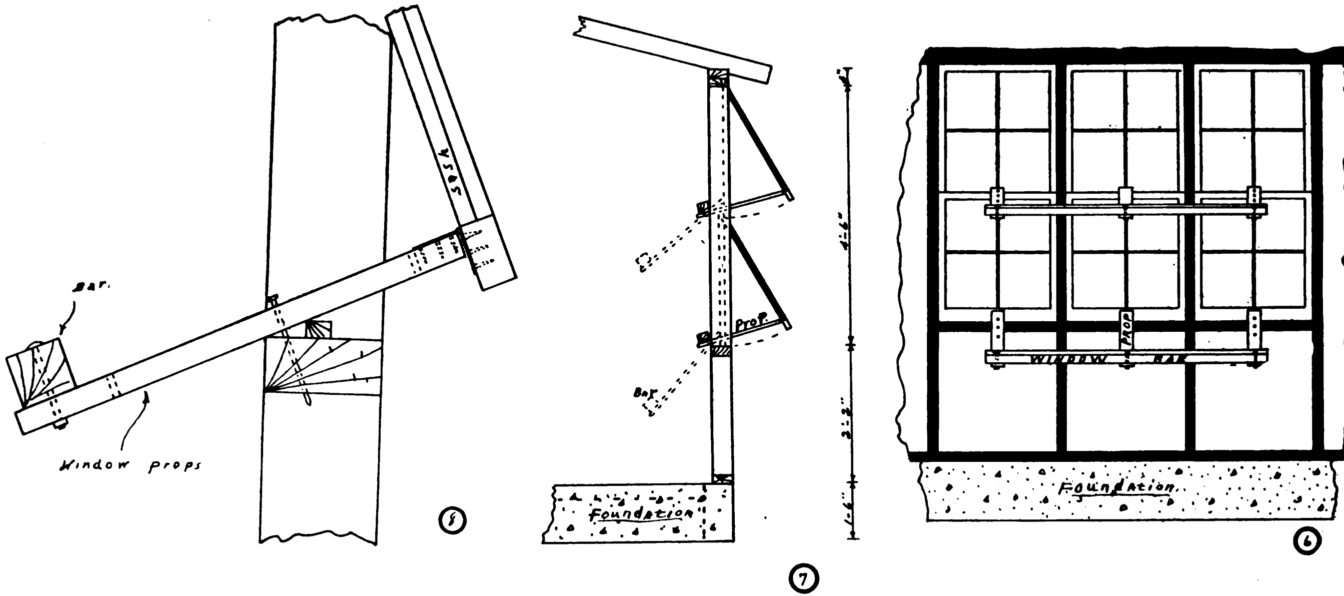
Fig. 79.

The height of this building from the foundation to the eaves, ceiling or floor is seven feet. The distance from the floor of the second story to the highest point of the gable is nine feet.

Fig. No. 80 shows the east side of the house with part of roof and part of wall cut away, to illustrate the droppings board arrangement as well as the frame work. It also shows three STAR OR KING ventilators on gable for the removal of all foul air, as it passes up through the slatted straw loft shown in cut No. 81, and, also, for the removal of heat from upper story during summer months. These ventilators should be placed as per drawing, about 12 feet from each end of gable, owing to the fact that all ventilation on the lower floor enters from practically all sides of the house and should, therefore, be attracted towards the center of the house for outlet as much as possible, as this encourages the removal of all foul fumes more effectively by compelling the air to pass over entire lower floor. You will please make note of the outside air inlet as shown in the foundation, beneath the droppings boards and roosts. You will note, also, the 8x8-inch ventilator box or tube as shown in Figure No. 80, which leads from the main ventilator to within 12 or 14 inches of the droppings boards. You will note that the top of this ventilator tube is cut at an angle of about 45 degrees. Over this opening is placed poultry



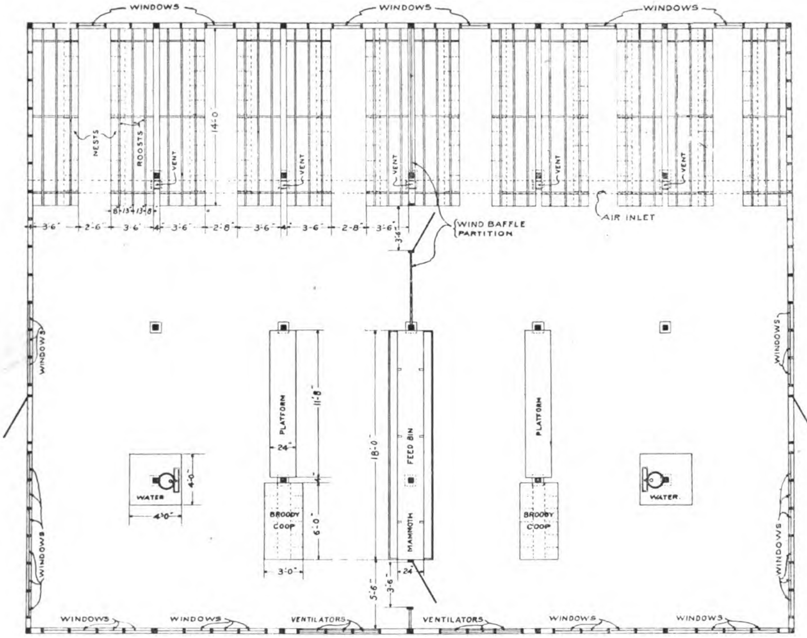
Figs. 80 and 81.



Figs. 82, 83 and 84 illustrate the proper method of arringing, hanging, raising and lowering the windows.

netting to keep anything from passing into the house through this opening, and, being cut at this angle, it prevents the fowls from roosting on same.

Fig. No. 81 shows the upper floor plan. The slatted straw loft is partly cut away on each side. This slatted ceiling reaches from the outside wall to the floor of the feed mixing and storing room on upper floor and is 20 feet in width on each side. About 4 to 6 inches of straw should be used on ceiling floor. The floor can be covered with poultry netting, or 1x4's to support the straw. The openings to the large hopper are shown as being 2 feet by 2 feet. They should be covered with a trap-door, flush with floor, so that the entire floor can be used without obstruction. These openings are cut out after the floor has been laid, so that there remains a perfectly tight floor over the remainder of the hopper. Bins can be arranged to suit the occasion, but I suggest that they be placed close to the walls to insure support from below, and so that it will not take up too much room. They must not be so high that they obstruct the air from passing through to the gable ventilators. Ample room must be allowed above each bin—say 2 feet—for this purpose.



48'-0"x60'-0" FOOL PROOF POULTRY HOUSE
Plan of Lower Floor

Fig. 85.

Fig. 85. This plan of the lower floor of the 48x60 Fool Proof Poultry House should be observed in conjunction with the entire frame work illustration to clearly understand the placement by measure of all main supports, as well as the intermediate framing for windows, doors and ventilators. Here is shown the placement of all appurtenances within the building that are located on the first floor, with their relation to the main supports of the building and from it all open areas may be accounted for. This view is especially useful when laying out the foundation and should be observed in connection with the foundation work.

Fig. 86. The second floor of the 48x60 Fool-Proof Poultry House, having feed bins, feed bin doors and an opening for a floating staircase, all of which have relation to main supports in a manner to be clear of them, to be built around them or be attached to them must be clearly understood. Hence, this view is prepared which provides clearly for the place of the stairs, clear

of all supports, the mammoth feed bin of the first floor is built around one main support and is attached to another and has two filling doors in the floor of the upper floor, while the scratch feed bins are supported by one main member and the shoots drawn from them are attached to the same, all in such manner that a heavy load carried by these bins is cared for by the method illustrated, that uses a small amount of material compared to the duties of the bins. The ventilator flooring is here shown over the entire space outside the center storage floor and the main supports from which to begin laying these floors as well as the center solid floor.

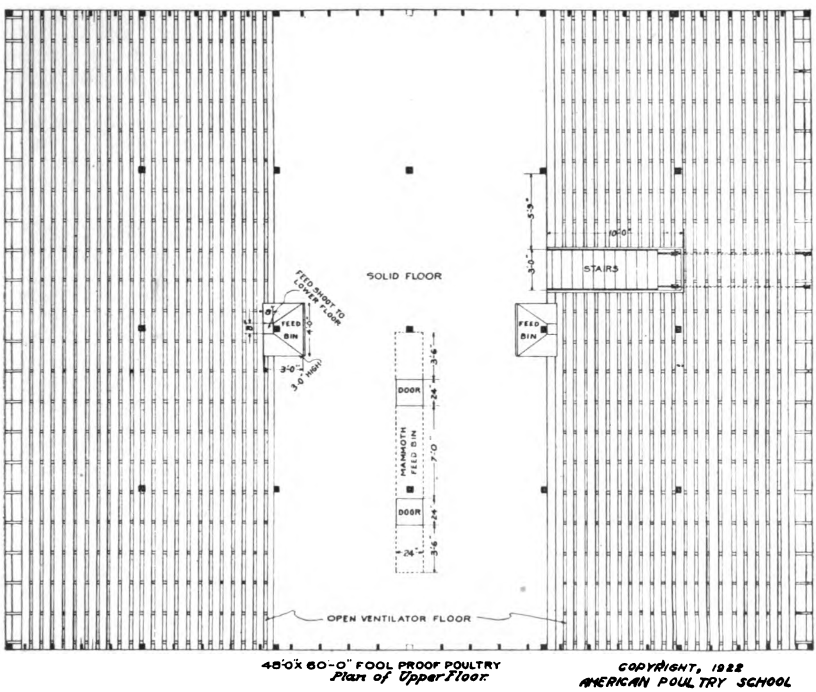
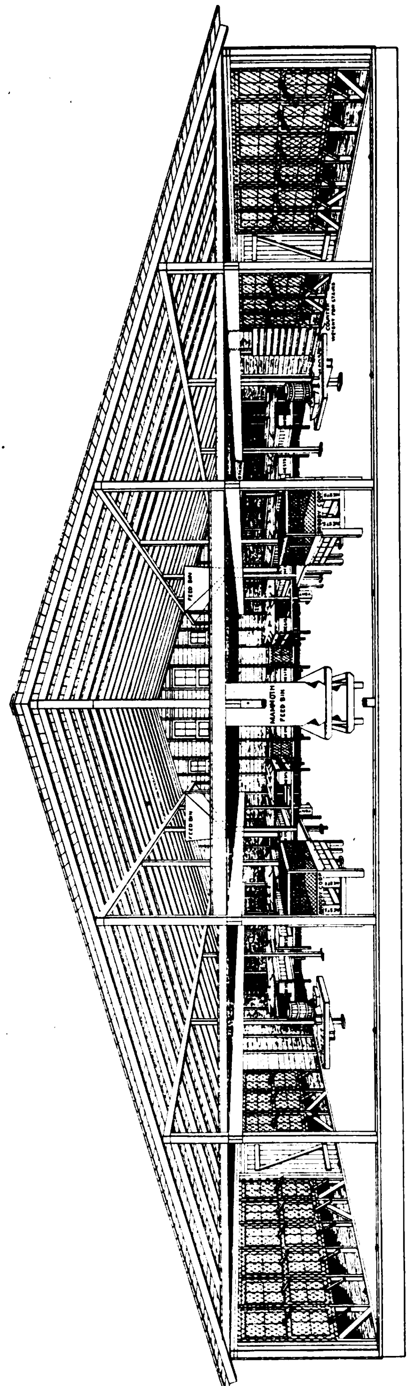


Fig. 86.

Fig. 87. This parallel perspective illustration of the 48x60 Fool-Proof Poultry House is expected to more clearly illustrate the manner of construction when observed in conjunction with the same kind of illustration of the frame work of the building together with the enlarged detailed drawings of the bins, water tables, etc. The grating for the balance weight, for the floating stair case as shown back of the last window at the right of the house is to keep the weight off the main floor by carrying cables over strong sheive pulleys in the upper floor. This illustration, when observed, together with No. 85, will show clearly just where all appurtenances are placed. It will be clearly noticed that the main thought uppermost in all the 48x60 house illustrations are the main supports of the building as considered apart from providing for the down spouts and floating stairs for the upper floor.

SPECIFICATIONS FOR WINDOW ARRANGEMENT

Fig. No. 82 shows the plan for the arrangement of the windows. You will note a 2x2-inch window bar bolted across the interior of the sash supports in such a manner that in grasping this bar (2"x2"), you not only open this window, but open all windows that are attached to this same bar. One-fourth-inch bolts are used to bolt the 2"x2" bar to the 1"x3" piece which extends out to the sash, and is there attached to the sash by a 2½x2-inch hinge. These hinges are placed on the underneath



48'0"X60'0 FOOL PROOF
POULTRY HOUSE
Interior Arrangement

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AMERICAN POULTRY SCHOOL

Fig. 87.

side of the 1x3-inch, and not on top. On the upper sash they are placed the same way and have to be cut into the outside sash. A 10-penny nail is driven into the upper edge of the top sash in the center, onto which the holes in the 1"x3" piece fit. A bar of some sort (2x2-inch) could easily be nailed onto the inside of the 2"x4" dimension material across the entire unit of windows and the nail driven therein to save the window, although the sash in itself is strong enough to sustain the weight of the upper sash. These units of three or four windows shown are located on the east and west sides of the 48x60-foot poultry house and the dimension material shown is therefore only seven feet high. The windows are shown attached directly onto the plate (double plate) whereon rest the rafters. Doing this brings the windows up higher off the floor and throws the light and suns rays further back into the house. No window frames of any sort are used, the sash being swung directly onto the 2"x4".

Fig. No. 83 is an end sectional view of the same scheme, and shows the manner in which the bar and 1x3-inch piece swings in and out during operation. These 1x3-inch pieces are 1 foot 3 inches long, and the length of the 2x2-inch bars are determined by the number of sash swung from that particular bar. A larger nail than a 10-penny nail can be used on the lever as it is driven directly into the 2x4-inch sill. Trouble may be experienced with the birds roosting on these bars, and in this case do not use the bar but fasten each window separate.

Fig. No. 84 shows a small detail of the lower sash swung half-way open with the nail in the center hole. This nail is driven on a slope, as per cut, so that it will easily enter the holes in the 1x3-inch props. This shows the bar for raising and lowering the windows; it shows the supports for holding the windows out in place; it illustrates the large nail driven into proper position, so that the holes which are bored in this support can be dropped down over the nail and the window held open at any height desired. You should have several holes bored in these 1x3-inch supports, so that the windows can be raised and lowered to any degree that you may wish them.

SPECIFICATIONS OF DOUBLE TWO-STORY DRY MASH HOPPER

Fig. No. 88. In constructing this hopper I would advise that you proceed as follows in order to facilitate construction as much as possible:

First, attach 2x4 (b) to the 2x8 joist of the upper floor extending down to the lower floor. These 2x4's are ten in number. Onto these are then nailed the 2x4 (d) and (c). At the ends are then nailed the 1x12 boards (a), four in number, and extending from the upper floor to the 2x4 (c). Onto these boards and simultaneously the 2x4 (6) are then nailed the 2x4 (e) and (f). Onto the 2x4 (e) and (f) are then nailed the boards (flooring), (k) and (n). The boards nailed onto (f) can be attached thereto with hooks and eyes in place of nails, enabling one to more easily clean out the lower trough if so desired. However, just previous to putting (f) into place, the 1x6 board supporting the center of sheet-iron troughs should be nailed into place, and the sheet-iron tacked into place. This also necessitates nailing 1x4 (y) onto the uprights (b), because the outside edge of the troughs are tacked thereto. When this is done, then proceed to nail (f) on; also, the 2-inch strips onto the edge of troughs and walk boards onto (d) and (c); (q) represents the sheet-iron troughs. Great caution should be exercised in cutting (n) and (k), to assure getting more or less than a 2½-inch throat between the lower edge of (n) and bottom of trough (q), and the lower edge of (k) comes to within 3 inches of the 2x4 (d). If this is not done waste of mash will occur or it will clog. (W^1) represents the throat of hopper from above. (S) represents upper walk-board while (t) represents the lower one. Two rows of fowls can stand on these when eating from the hopper; therefore you get double the capacity from each hopper. This hopper is illustrated more in detail in Lesson 5.

IMPORTANT FACTS

I should remind you of the fact that there are 24 laying nests under each set of droppings boards, and an additional 24 nests in each 30x40-

foot unit arranged underneath the broody coops, as illustrated in cut No. 79. These nests should not be less than 2 feet off the floor, so that the birds can pass underneath. The droppings boards are 3 feet 3 inches above the floor, permitting the light to pass far to the rear from all sides. I have drawn the sub-vent in solid black, so that it emphasizes this feature more clearly. This sub-air-inlet tube is 12 inches in diameter, and

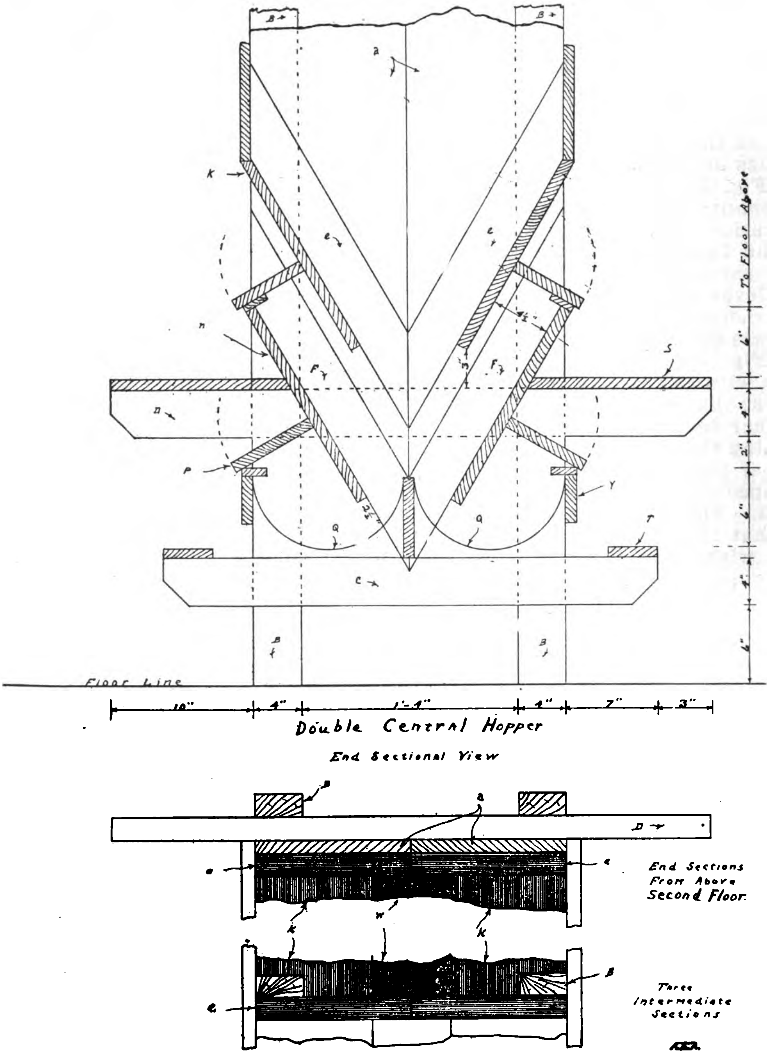


Fig. 88.

reaches through under the entire building, so that air enters from both ends. The floor air inlets are 8x8 inches by 2 feet 6 inches; this gives the proper ratio with reference to the two ends of the 12x12-inch sub-vent. We do not give a detailed bill of material or any estimate as to the cost of the house, because prices vary so in different localities, and a house of this style can be built in any size, from 20x20 feet, as shown in our lessons 3 and 4, illustrated under the title of the Missouri House, up to and including a house 48x60 feet, as shown and illustrated in the above figures. We recommend this house in the very highest terms, to

parties conducting commercial egg farms where it is important to find a large house that will give more general satisfaction in both winter and summer. You should construct a light stairway, which should be hinged at the top. This stairway should be arranged so that when it is raised it fits an opening in the ceiling of the first floor. The lower end of the stairway can be raised and lowered very easily, if it is practically balanced by a rope and pulley, on the opposite end of which is placed sufficient weight to balance the weight of the stairs.

A house that is built on a nearly square plan will cost you less than a long house, and if you wish to construct a house of this sort any ordinary carpenter or lumber dealer can figure out a bill of material, after he has

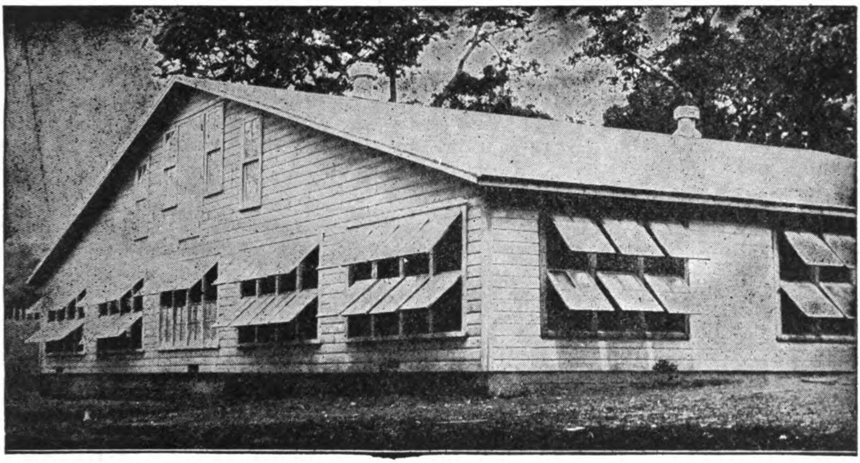


Fig. 89.

An exterior view of the 1,000-Hen Fool-Proof Laying House, 48x60 feet. This shows the windows raised and the house in actual operation. There is no house that we can recommend for a large flock which we believe will give such universal satisfaction in the ordinary climate.

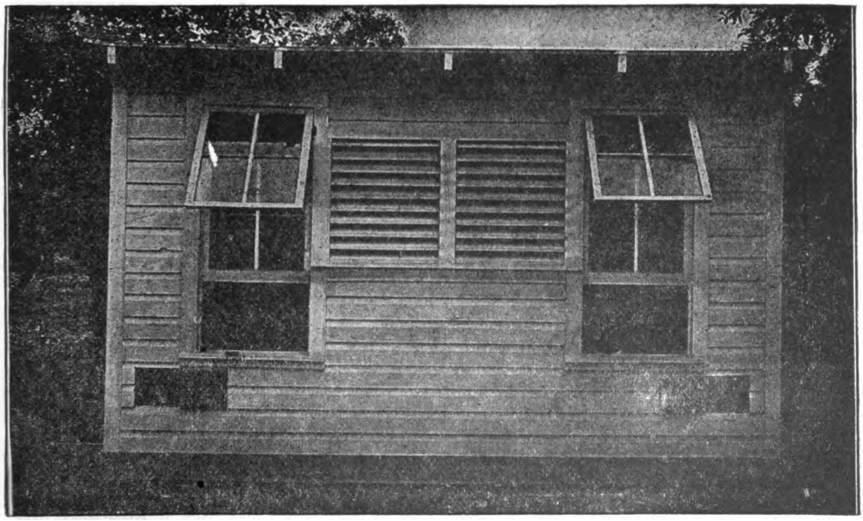


Fig. 90.

Front view of the Fool-Proof Colony House, showing the top window sash raised and the exits open.

read the above description and given proper consideration to the illustrations.

We like to have the windows and ventilators in our poultry houses hinged at the top so that they can be opened outward as is shown in the above illustration. In order to prevent the windows from blowing off the hinges and being broken it is necessary to firmly fasten them. For this purpose we use a heavy clothes line wire or a heavy smooth fencing wire. The end of the wire next to the house is bent into a circle or ring, and into this ring is driven a large staple which fastens the wire to the house or window frame. The other end of the wire nearest the window is bent at a right angle so as to form a hook. A staple is then driven into the underneath side of the window frame and this wire or hook is fastened into the staple which holds the window in place as is shown in this illustration.

When you wish to close the window, the wire hook can be removed and the window drawn down into position.

You will note that on the interior of the house we use one-inch poultry netting. This prevents anything from getting into the house and prevents birds from getting out when you wish to confine them. It also prevents the birds from flying against the window lights and breaking the windows.

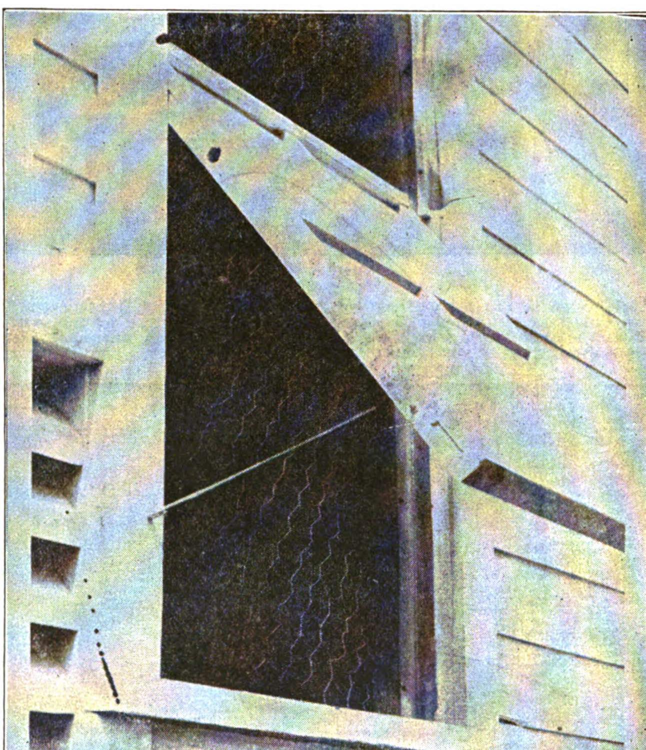


Fig 91.

PLANS, BLUE PRINTS AND SPECIFICATIONS

We can furnish plans and specifications for the houses shown in this lesson. The plans are very complete and the drawings are large enough so that any ordinary carpenter, or in fact, any one who can use a hammer and saw ought to be able to build one of these houses without any difficulty what ever. The complete plans and specifications range in price from $2.00 to $3.00.

QUESTIONS ON POULTRY HOUSE CONSTRUCTION

Lesson No. 2

1. Is it desirable to have many doors in a house and how should they be hung? Discuss their use.

2. How, and of what material should the roosts be made? How high should they be above the droppings board?

3. At what height would you place the droppings boards from the floor? How would you construct them, and what are the advantages of a droppings platform?

4. What are the advantages of having a feed bin in a poultry house? What should be its minimum capacity?

5. What is the object in having partitions in houses, and wherein should these partitions differ in different houses?

6. What is the object in having litter in a house? How deep should it be in winter and summer?

7. Explain what you consider the most practical system of yarding poultry. Is it advisable to yard it at all? What difference would you make in yards for a breeding house and in yards for a laying house?

8. If a concrete floor is to give satisfaction, what things must be given special attention in its construction?

9. What use can be made of a colony house on the farm?

10. If we are to make money from a flock of laying hens, can we do it best by dividing them into small colonies and scattering them about the farm in Colony houses, or can we do it best by keeping them in large flocks in large buildings? Why?

INDEX

Modern Poultry Houses

BY T. E. QUISENBERRY

INTRODUCTION

There has been a decided evolution in the art of poultry housing in recent years. But the poultry people have merely followed the practice of scientists in the care of the human family. They are merely stressing the fresh air principle. There is no uniform house best suited to the entire country any more than there is one best ration suited to the poultry industry of all sections of the United States.

There has also been a marked change in the use of glass. Making carnations or roses bloom in winter and making hens lay at the same season certainly involve opposite conditions. The old type of house with its solid glass front was a good agency to lower vitality and foster disease, but not the type to make vigorous laying stock.

Fresh air serves two purposes. The first purpose is to furnish oxygen, the second is to carry off the bad air. The control of temperature of the fowl and man is different. The human body has sweat glands and, where there is an excess of heat, these glands secrete moisture, which tends to lower the body temperature. The temperature of the fowl is not lowered by perspiration, but the evaporation takes place through the lungs and respiratory organs.

The tendency is to handle fowls in much larger units than was at one time thought possible. We have the enthusiast, who has gone to the extreme in the restriction of fowls to very small flocks, and those who go to the other extreme, and advocate the handling of them in larger numbers than is consistent with safety.

In the poultry work, just as in everything else, there is a happy medium. We believe that happy medium to be about 500 hens. The best plan is to make a study of the houses that we give that are recommended for the various sections and select the one that seems best suited to your individual needs. In our opinion the Fool Proof House comes nearest meeting all conditions. In mild climates it should be cheapened and made more open. In cold climates muslin can be tacked over the interior of the ventilator in extreme weather.

Consider, first, the type of poultry farming you expect to engage in. If you wish to start in a small way and build gradually into the handling of poultry in a large way, it would be well to select one of the houses, which offers a standard unit, which may be added to each year as the business increases. Ordinarily, a house of twenty foot depth is deep enough.

It is important that you have a laying house that meets all the conditions that we have outlined for a good laying house. But the chick, from the time it breaks the shell should be properly housed. You cannot hope to place your chickens in a long brooder house that holds several hundred, grow them to maturity in crowded quarters, on polluted soil, and be able to get results from them, it matters not how well you build the laying quarters.

ECONOMY

You cannot afford to make the overhead costs too much. For large laying houses the cost should not exceed $1.50 per bird. With small colony houses the expense will run as high as $2.00 per bird.

It is often possible for you to remodel the house you have or convert some house that has been used for other purposes into a house that will meet all requirements. Very few farm poultry houses are adapted to housing fowls. We often find it more practical, in trying to help farmers place their work on a better paying basis, to advise that they

take their poultry house, which generally has no place to admit sunlight, remodel the entire front and make the two ends, the roof and the back side so they may be made practically air tight. Many models are given in this lesson, and it is possible to take one of the many designs given and make the front suit the needs of the climate in which you live.

Our object for describing and illustrating the different styles of houses is to give you a broad view of the different styles of poultry house construction. But always bear in mind that the method of ventilation and construction as illustrated in the Fool Proof type is what we recommend, and for large laying houses we regard the large two-story Improved Fool Proof House, or a house similar to Mr. Lawry's Hendwell, as the best, if your land is of such a nature that it will stand this number of hens on it, and if it is not that kind of soil you had better be very careful about building any kind of a house on it.

Oftentimes, if you have a suburban farm, you can buy cheap lumber from men who are tearing down old houses in the nearby town or city. A roosting closet can be provided, droppings boards put, in and all the necessary interior fixtures can be made.

For the roofing it is not necessary to buy an expensive grade of lumber, if you expect to use roofing paper over it. It is well, though, to use dressed tongue and grooved material for the walls.

The first essential is to provide a house that affords ample sunlight and fresh air without drafts, and have an interior that can be easily kept clean and sanitary.

KEEPING DOWN THE BUILDING COSTS

"Whatever the style of house or the size, convenience in attendance is a principal requirement. The location of doors, the arrangement for opening and closing curtains and the arrangement of the interior fixtures must be such that the work of caring for the birds can be done with the least possible expenditure of labor. Labor is one of the greatest cost factors in keeping poultry and every plan or means to save labor is earning dollars for the owner.

"The poultry house should not be built of expensive material with fancy trimming and superfluous fixtures. Simplicity of design and suitable materials will do much to keep down the cost and at the same time insure efficiency."

LABOR SAVING DEVICES

If you are conducting a poultry business on a large or small scale you need labor saving devices. The larger the business the more necessary it is that everything should be planned to save every step possible. In the long laying houses it is necessary to have double swinging doors that will permit the attendant to go from one pen to the other with ease. One of the biggest labor saving devices is the dry mash hopper. They should be built large enough so as not to necessitate too frequent filling. The droppings boards should be so arranged that they can be easily cleaned, either by placing them on hinges so that they can be raised out of the way, or by making them portable so that they can be easily taken from the house when it is being sprayed.

The nests should also be handily located, so that as little time as possible will be consumed in gathering the eggs. Many automatic devices are placed on the market with a view of having the birds perform part of the labor. As a rule they are impractical. We have seen automatic markers designed to take the place of trap nests, and the droppings boards so arranged that the droppings would fall on the outside of the house. Such things are impractical. You cannot eliminate a certain amount of work that is absolutely necessary, but it is possible to make the work easier by having everything handily arranged and by making devices for the holding of feed that will last several days. When water is available it is possible to pipe the water to the building and have an automatic stop valve which will regulate the water flow, but care must be taken to keep the water purified, to keep the foundation clean, and to prevent the spread of disease.

SUNLIGHT

Sunlight is nature's own way of taking care of disease germs and the house should be so lighted and so faced that the sunlight can penetrate the greater part of the building. During the day time it gives warmth, makes the surroundings more congenial, and inspires the birds to keep busy and happy.

It is very necessary that the greater part of the building have an abundance of sunlight at some time during the day. Facing the building in the right direction helps to make this possible.

PLENTY OF FRESH AIR

There is nothing that prepares the birds better for the contraction of every kind of disease than a house that does not admit plenty of fresh air. This does not mean that the birds should have a constant draft on them, but they must not rebreathe air that has been used by other birds.

The impure air settles to the bottom and it is possible, in the large laying houses, to use some kind of a ventilating shaft which will reach to the floor and carry off the bad air. The air can be admitted by a shutter ventilator, a muslin curtain, or by having an open front. This is not often necessary, for if an open front house of some style is used the fresh air will take the place of the impure air and drive most of it out.

The old fashioned, closed front houses are always poorly ventilated, unsanitary, and damp in fall and winter, and early spring months. Fowls confined to such houses are almost invariably affected with colds, roup, and other diseases. The popularity of such houses is a thing of the past.

The old fashioned scratching shed houses were more expensive to build, and while the fowls had better conditions to work under during the day-time, as a rule, they were provided with dark, poorly ventilated sleeping quarters, adjoining the scratching shed. The open front, curtain front, and shutter front houses are proving more satisfactory and more popular. Some poultrymen got the idea that if a little ventilation was a good thing, a great deal would be far better, so they went from one extreme to the other. The shutter front, which we have provided in our Fool Proof Houses, has hit upon the happy medium and provides for almost ideal ventilation. For warm climates it is scarcely possible to provide for too much ventilation.

VENTILATION OR PURE AIR AS A FACTOR IN HEALTH AND DISEASE

Some years ago some of our most prominent physicians asserted that impure air was the direct cause of tuberculosis and other diseases. A short time after this a scientist perfected the magnifying glass or lens, so that specialists were able to find the real cause of these diseases, namely, bacteria. Then other students began to think along different lines and finally proved that pure air, proper ventilation, and climatic conditions had a great deal to do with the cure of diseases. It will be impossible to go into detail in explaining how diseases are caused, nor all the facts relating to ventilation and how the afflicted fowls are benefitted by pure air. However, the general principles apply to poultry as well as to the human race.

Air is ordinarily composed of nitrogen, 78.20 parts by volume; oxygen, 20.76 parts; carbon dioxide, 0.04 part; a trace of ammonia; traces of nitrous and nitric acids; a small amount of ozone, especially in the country or near the sea shore.

The main natural gases in the air that have any influence on the health and disease are oxygen, carbon dioxide and ozone.

Nitrogen is merely a neutral gas and is used for plant life by certain legumes.

Oxygen, ozone and moisture are the necessary agents in air to maintain health. The gases mentioned must be mixed in certain proportions, also, to be of the most benefit.

Nitrogen is taken into the lungs and passes out again without being absorbed. Oxygen is taken in and transfused through the lung cells to the red blood corpuscles. These corpuscles carry the oxygen to the tissue

cells, where it is used to oxidize the food that the cells use. This produces heat and energy, and carbon dioxide is formed. The carbon dioxide is returned to the lungs and is given off to the lungs through the air cells. In other words, carbon dioxide is traded for oxygen. Oxygen makes the blood red and carbon dioxide makes the blood blue. So you say blood is healthy when it is red. Ozone is another good property of air, but it is not always present. It is found in the country or seashore, but not in the cities to any extent.

Carbon dioxide is heavier. Often fowls roost near the center (between the top of the house and the floor), and then the problem is to get pure, fresh air into the building without drafts or sudden changes of temperature and moisture.

The air at the top of a room is always warmer than at the bottom and the warm air is pure in this case. A room may be cool and seem quite fresh to a person who has been in it for some time, but if he should step in from outside it would seem depressing.

Gases normally mix by diffusion—that is, by bringing two kinds together in a sack and, allowing them to escape, they would mix in a short time. Air is normally composed of a certain proportion of gases and the tendency is to keep that proportion. The proper thing to do is to get plenty of fresh air into the chicken house, without a draft, and to get the foul air out. The greater per cent of foul air is at the bottom of the house. Carbon dioxide is in the lower half of the house whenever the temperature is below 80 degrees. It rises when the temperature is higher than 80 degrees. Therefore, have plenty of openings at the base to allow it to diffuse with the outside air. The air should come in through the ventilators and be directed upward, because it diffuses through a wider space as it becomes heated and expands. As it expands it helps to crowd out the foul air at the floor. Since more attention has been paid to proper ventilation, fewer colds and diseases have been the results. The Fool Proof House is a good example of proper ventilation.

Prof. King, in his Physics of Agriculture, states that hens breathe 8,278 cubic feet of air in 24 hours for every thousand pounds of live weight; while man requires 2,833 cubic feet and cattle 2,804 cubic feet.

When a great number of hens are confined in one house, which is not properly ventilated, it can be readily seen that they will consume the oxygen and emit a great amount of moisture from their lungs. If the house is not properly ventilated this moisture will collect on the walls

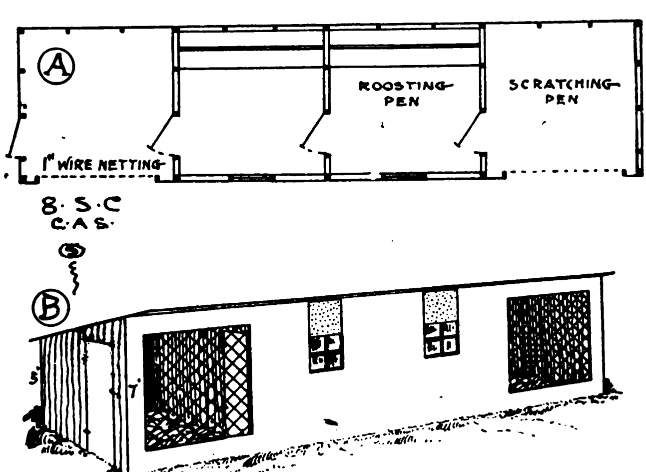


Fig. 50.—House with separate scratching shed. It is a waste of room, and building material to have a scratching shed separate from the roosting room. Otherwise there is no objection to it.

of the house and when it comes in contact with the cold walls a frost will form. This melts, wets the straw in the house, and fills the house with moisture. The curtain front, open front and slatted ventilators were designed with a view to avoiding such condition.

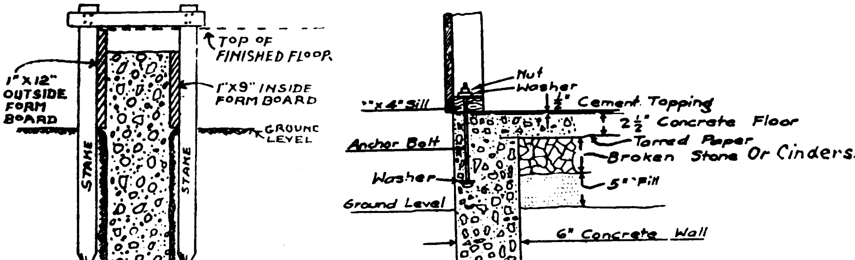
WHY WE ILLUSTRATE DIFFERENT HOUSES

The object in showing different styles of poultry house construction is to acquaint the students with the various types of houses which are used in different sections and by different authorities. If we recommend a single house, to the exclusion of all others, the students of poultry house construction would be limited to a single idea. In order to broaden you and help you to recognize the good from the bad, we feel that you should be given information concerning these different styles of houses. For that reason we illustrate and describe some of the best types in use. We have attempted to present a sufficient variety to meet the requirements of poultry men and women in all parts of the country. Prices of various kinds of materials and supplies vary so in the different sections at the present time that estimates of construction would serve no practical purpose. I wish to impress upon every student that, in poultry house construction, experiments are costly, and for that reason, I would recommend that you stick closely to the general style of our improved Fool Proof House, Colony House, Breeding House, and 1000 capacity Hen House for a large flock of layers. I would vary the construction only in such a manner as to meet my own satisfaction and the climatic conditions prevailing in the particular part of the country in which I was located. In extremely cold climates I would line the walls of my house with plaster board and use cloth curtains over the interior of the shutter ventilator. In warm, or mild climates, I would build the houses more open and construct them as cheaply as possible. Carefully consider your needs and requirements, then select the size and style of house which most nearly meets your conditions, and follow the general plans from foundation to roof. You will find, in most cases, that this will save you time and money, and that you will have a building which will not disappoint you when put to a practical test.

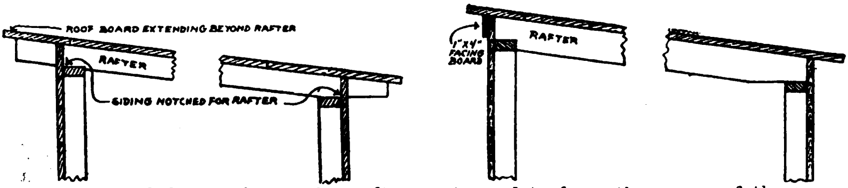
AMOUNT OF SPACE TO EACH BIRD

This varies with conditions. If you are using small colony houses it is necessary to give from four to four and one-half feet of floor space. If the birds are kept in large numbers in a big house two and one-half square feet of floor surface can be used. Each bird has a much larger surface in the large house which can be used to roam over. In a house for a hundred hens about three to three and one-half feet is about right. These are the requirements for the laying hens. Breeding stock should have more room. Many troubles are brought about on account of the over-crowded condition of the houses.

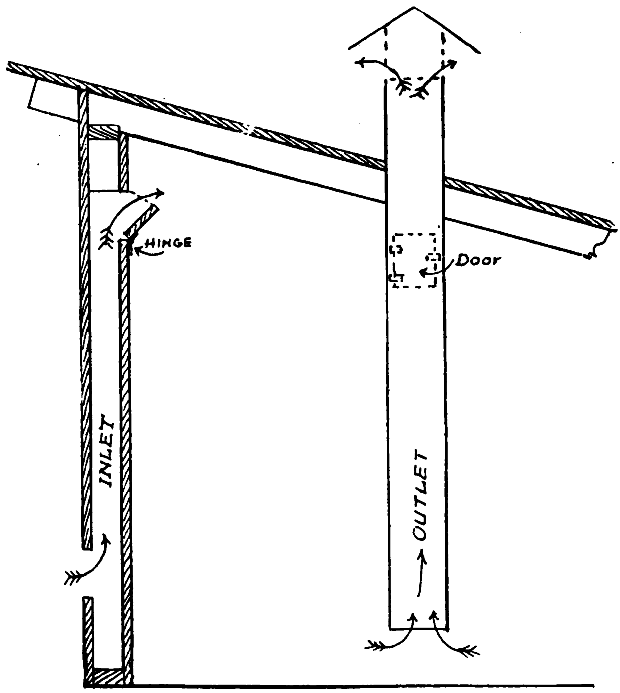
THE KING VENTILATING SYSTEM



On the left is shown the construction of a concrete foundation. **On the right is shown** the correct method of laying concrete floors. **A two-inch concrete floor**, over a few inches of well tamped, broken stone, gravel or **cinders, and a layer** of tarred paper, will make the floor dry and comparatively **warm. Note** the method of anchoring the building to the foundation **by means of bolts.**



On the left are shown the rafters extended to form the eaves of the house. On the right the rafters are cut flush, the eaves being formed by the roof boards.



King ventilating system is illustrated above. Where buildings are to be ventilated and where muslin curtains are not desired, this method has been found practical and satisfactory. The air is admitted through an intake on the outside near the ground and passes up between the inner and outer walls, or through a flue provided for that purpose. Near the center of the house is located a flue, the opening of which is about a foot above the floor, which carries the foul air out as shown. The air circulation is controlled by the adjustable doors in the top of the intake flue, and a door is also provided in the outlet flue, near the ceiling, which furnishes supplementary ventialtion in hot weather.

CONDITIONS THAT GOVERN THE BUILDING OF THE HOUSE

The Leghorns need a better protection than do larger breeds, because their combs are so much more easily frozen than the combs of breeds having smaller combs. Birds that have been improperly reared and have weakened vitality are much harder to protect than strong, vigorous birds. The amount of moisture in the house affects the birds greatly. Moisture is increased by too much glass and by overcrowded condition of the birds. If the birds are kept busy and their digestive organs not over-taxed they are better able to withstand cold.

THE WINDOWS

Cornell University Poultry Department is recognized as one of the best in this country and they recommend the following:

"Small glass in window-sash seriously obstruct the light. Very large lights break too easily and are expensive. Eight by ten is a good sized glass to be used in a 12-light sash, making it about 3 feet 9 inches high by 2 feet 5 inches wide. Use two of these for a house about 15 feet square. Single sash are usually less expensive than double sash of the same size, and the cost for the window frame is less. Single sash may swing from side, top or bottom; from the middle vertically or horizontally; or it may be made to slide to one side.

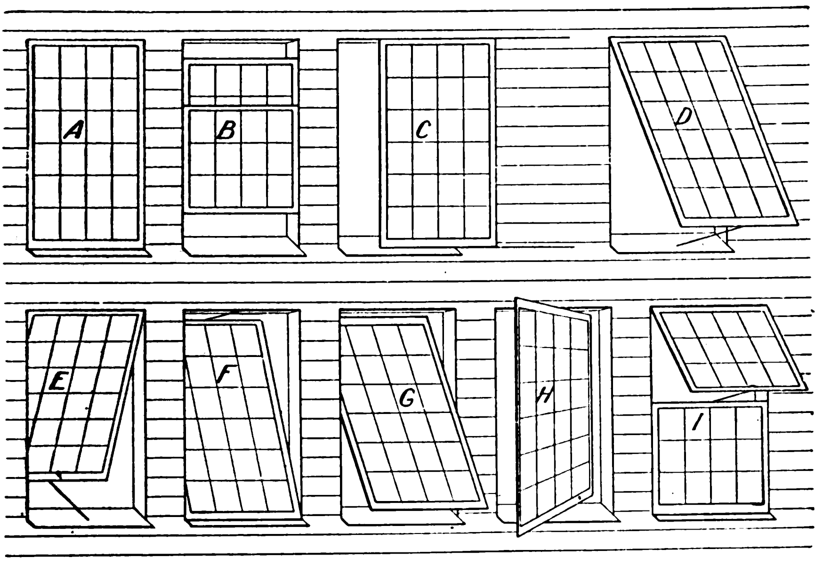


Fig.22.—Courtesy of Cornell University. Showing plans for hinging and swinging windows.

"There are advantages and disadvantages with each of the windows shown in Fig. 22. Fig. 22a swings from the side. Wall space must be provided in order to swing the window around out of the way. This method of swinging the window is the easiest and admits of the window being placed where it will be least likely to be broken, and where it does not obstruct any part of the window opening, an important matter in the summer season. Heavy hinges are necessary. Fig. 22b makes removal necessary for summer use and cannot be quickly closed when thus removed. Fig. 22c is rather difficult to move because so heavy. Figs. 22d, e, f, g, and h cannot be removed or swung out of the way quickly, if at all. Fig. 22g and h are likely to be broken by heavy winds. Fig. 22g and h make it difficult to have wire over the window opening either inside or out. With Figs. 22b, d, e, f, g and h the windows cannot be used conveniently for passageways to clean, spray or litter the pens. Figs. 22e and f are likely to fall and break, and Fig. 22g to break loose from the hinges. Fig 22i is perhaps the best. Hinge the windows at the top and swing them as in 22a.

THE DOORS

"A good door must be wide enough to permit the attendant to enter conveniently with pails or baskets in each hand, and to be opened and closed with the least possible loss of time.

Fig. 23 shows method of hanging doors. Figs. 23a and b differ only

in the fact that 'a' swings into the room instead of against the end, and requires the person entering to open the door wider, which is likely to frighten the fowls. Fig. 23c is a 'Dutch' door, the upper and lower halves opening separately. While generally not to be recommended, this type of door is found convenient to permit the upper part to be opened to allow the fresh air and sun's heat to enter, while the bottom prevents the wind striking the fowls. The door, Fig. 23d opens outward instead of inward, which generally is not satisfactory, owing to the fact that it is not so handy to pull and open as it is to unlatch and push. Fig. 23e is a double

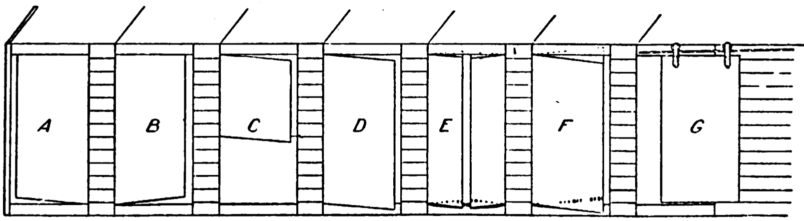


Fig. 23.—Courtesy of Cornell University. Plans for doors.

door that swings both inward and outward. It is the most unhandy of all except when it is necessary for a trolley to pass through. Fig. 23f swings on double, reversible hinges, which is a convenience and works well, provided the springs are heavy enough to swing quickly and firmly against a rubber pad on the door to prevent back motion. All self-closing doors have the disadvantage of occasionally injuring fowls. The rolling door, Fig. 23g, is not tight enough for outside use, but may be used to good advantage for partition doors. The track should be inclined to permit the door to close quickly and automatically. All doors should be raised above the floor six inches, so that the bottom will clear the litter; and a space should be left between the bottom and the sill on interior doors to prevent decapitation of fowls that might get caught while the door is swinging.

'Interior doors should be fitted with spring hinges, weight and pulley or other device to obviate the loss of time in opening and closing latches." Fig. 23d is perhaps best for an outside door.

CONCRETE FLOORS

Concrete floors are more costly to put in, but they help to eliminate the rat nuisance. Rats often accumulate under plank floors and succeed in eating as much food as the fowls get. Unless the concrete floors are kept covered with straw they are too cold and the fowls injure themselves in flying from the roosts. But straw is a necessity in any house and by keeping the floors covered all of the disadvantages can be overcome.

A good board floor is the cheapest good floor and is in more general use and is recommended.

DIRT FLOORS

There are many disadvantages in having a dirt floor. The capillary moisture will rise and this will create dampness. Unless the soil is renewed very often disease germs will develop. If you use the dirt floor be sure to remove several inches of the soil occasionally and put in fresh earth.

Another great disadvantage, if you use straw on the floor, is that when the soil dries, the house will be filled with dust which is injurious to the health of the birds.

TILE

If the ground on which the house is located is inclined to be damp, put in a tile, completely around the house, to carry away the surplus moisture.

BUILD SIMPLY

There is no necessity for having anything but a simple design for a poultry house: The main idea is to keep down cost and build a comfortable and durable house. A movable colony house must be very strong to with-

stand the strain of moving and the runners should be made of first-class material so that it will not rot out so rapidly, and when they are pulled in for the winter they should be blocked up off the ground. Never build a house on the ground with the sills resting on the earth. Either have concrete foundation or, if you prefer the plank floor, put the house on pillars of some kind.

The house should be high enough in front so that the attendant can work in it without inconvenience. The house can be built with a height of about 8 feet in front and the back wall should be at least 4½ feet.

NESTS

Nests should be portable and convenient to handle. This renders them easily cleaned. It is generally thought a better plan to darken them, as the hens seem to prefer dark pens for laying and it prevents egg-eating to a great extent.

The nests should be underneath the droppings boards, or on the side walls.

ALLEYS

In commercial poultry keeping there is no necessity of having alleys. They are expensive to keep clean and occupy large space that the birds should have. The alley affords very few advantages, but many disadvantages.

THE STRAW LOFT

In extremely cold climates straw lofts are sometimes used. There are some objections to this plan, but it gives satisfaction in cold climates.

The straw collects dust and becomes a breeding place for insects. If it is used, as soon as the warm weather begins, all of the straw should be taken out and the loft sprayed. The loft should have windows to let in fresh air which drys out the moisture which is taken up by the straw.

LOCATING THE FOUNDATION

Fig. 23Y. The location of the house having been decided, find the desired height of the floor and represent this level by X. This level should be at least twelve inches above the highest point on which the house will

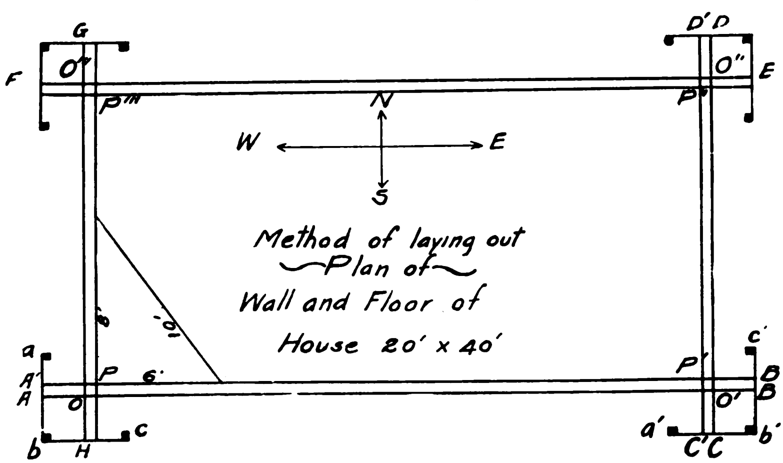


Fig. 23Y.—Courtesy of Cornell

be built, except on very uneven land, when it may be advisable to excavate, grade, and build part of the floor below the original ground level. Locate a corner of the proposed building, and about this corner drive three stakes, as a-b-c in Fig. 23Y, which are approximately 3 feet apart. On each of these stakes find the level of X and connect these points by boards, as represented by a-b and b-c.

The level of the floor can be determined either by the use of the transit which is best for accurately laying out large buildings, or with a spirit level and straight-edge, which are equally efficient in laying out small houses. When using the level and straight-edge, drive a stake at a centrally located spot and saw off this stake at the level X (the level of the floor.) Then with a spirit level and one end of the straight-edge on this stake it is easy to obtain the level X on the corner stakes. When the distance between the center and corner staks is longr than the straight-edge, intermediate stakes may be driven. Each intermdiate stake is made level with X.

From a point A on the cross boards a-b a line is stretched in the direction of B, which is the desired frontage of the house. Measure off on this line from the point O the length of the desired house, and about this point O, fix stakes and cross boards level with X similar to those at the initial corner O. Then fasten the line, a-b at b. This represents the front edge of the permanent wall and floor. Next, with the square find the point C which, when connected with the point O', makes a line at right angles with a-b. Mark off on this projected line c-d a distance from O' to O" equal to the desired width of the building, and about this corner O" place the usual level corner boards. In finding the last corner of the house mark off a line e-f from O" the length of the house, and on a line h-g from O the width of the house. Swing these two lines together until the two distances intersect at the point O". Then fasten lines e-f and h-g at the corner boards level with X about the corner O".

The four corners of the house are now indicated by the intersections of the four lines a-b, c-d, e-f, and g-h. These lines also represent the level of the floor and outside line of the foundation. They can be removed at any time and later replaced by simply connecting the points a, b,c,d,etc., on the permanent corner forms.

For checking the square corners of the wall, use the 6-8-10 rule. Other lines, such as A'-B', C'-D,' etc., can be made by connecting the points A', B', etc., which are located at an equal desired distance from A, B, etc.

For checking the square corners of the wall, use the 6-8-10 rule Measure 6 feet in one direction from the corner and 8 feet in the other. If the two points thus determined are 10 feet apart the angle formed by the lines connecting the points with the corner will be a right angle.

THE COLONY HOUSE

We think the colony house indispensable in your work. It is the dual puopose house that can be used for brooding the chicks, growing them during the summer months, and even to house a few hens that you wish to keep over for eggs during the winter. They, of course, cannot often be used the same season for breeding stock also, as they will be called into

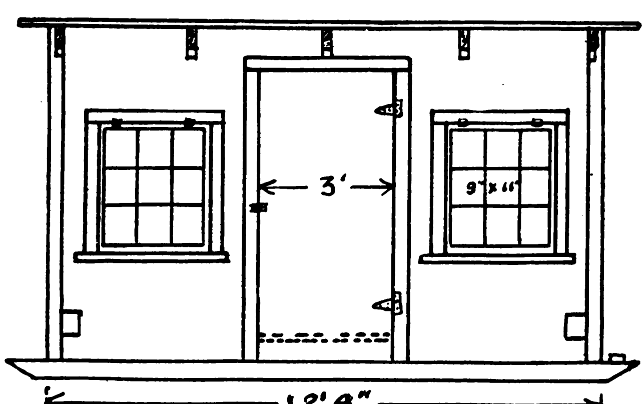


Fig. A.—Front View of Michigan Colony House.

use in the early part of the hatching season for the chicks. However, if you desire to keep over layers for egg production and you intend to sell the pullets when eggs begin to decline in price, it is possible in this way to keep the colony houses in almost constant use. You can also use them for fitting birds for the show or to keep surplus cockerels.

Prof. Halpin, of Wisconsin University, has this to say concerning the use of colony houses for commercial purposes:

"For commercial use I believe it will be practical for a man to have a sufficient number of these houses to accommodate all of his hens in flocks of twenty-five during the winter. As the hens were needed in the spring for baby chicks double the hens together, as the hens would then be outdoors to quite an extent, so that from a half to two-thirds of the houses could be made available for baby chicks and the other houses furnish ample roosting and laying room for the hens."

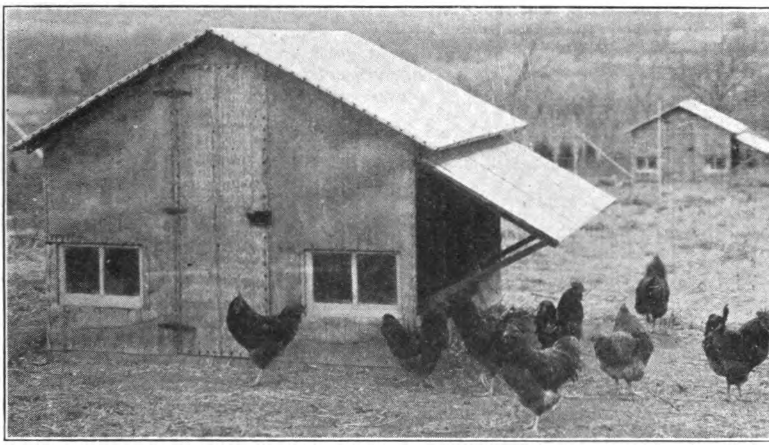


Fig. 2.—Colony House as used by the poultry department of the Kansas College of Agriculture. The sides can be raised as shown during the summer months and lowered in winter.

The Experiment Stations differ as to the kind of openings that colony houses should have. This is the main difference you will find in the illustrations given you and it is certainly an important point. (See Figs. A, B, 1, 2, 3, 4 and 5.)

The colony house is in more general use than any of the types we discuss. Just as in the long laying house or the farm house for a hundred hens, there are various ideas of the best type to be used. This house can be used for the small town flock or it answers an excellent purpose in housing the young, growing stock. It is generally made so that it can be drawn from one place to another and for that reason should be substantially built.

The shed roof type is the more economical, can be more easily built than the gable roofed type, and is in more general use. This roof may be covered with cheap boards over which roofing paper may be used, or you may use shingles or flooring boards well painted.

The A shape colony house is in use at Cornell University and at the Utah Experiment Station. This type of house is common in the Little Compton district in Rhode Island and is a house that can be made very strong and well adapted to being moved. The shed roof house has more advantages and we like it better.

It is not practical to build the house too large, for the difficulty of moving it is too great. Eight by twelve is about as large as they can be made and moved by a team.

There is no doubt but that pure air is the starting point of poultry

housing. Birds that roost in trees and have the run of the farms do not often have roup and tuberculosis. Only the fit survive, and each year this type breeds a stronger race and one more fitted to endure the winter's cold. Fowls housed in stuffy houses fail to get enough oxygen to make rich red blood. They have ruffled feathers and their system is in such shape that they take little exercise and cannot stand any kind of exposure.

What is aimed at in good housing is to get ample fresh air without drafts and keep the body of the bird fairly comfortable so that they can produce eggs when you want them most.

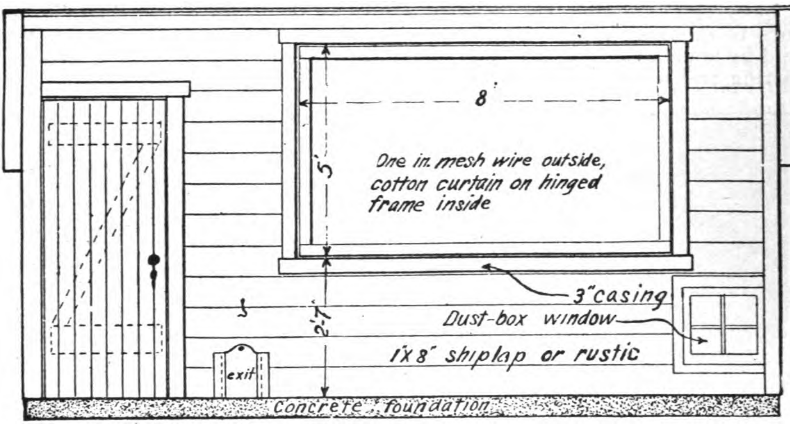


Fig. B.—Front View of Utah Colony House.

For farm use, the portable house is coming into more general use. In this house the young chicks can be placed when they emerge from the shell, started near the house where it is convenient to give them the proper attention, and then later, when the heat can be taken away and when they require feed less often, they can be carried to the edge of the corn field or to some place that will give them range and opportunity to help make their own way. This will give them ample exercise to harden their flesh and make their coats glossy and tight fitting.

But, with the man who wishes something else besides show room qualities, health is not the only consideration. He must get eggs to pay for the feed, and, therefore, study should be made to give them, as nearly as possible, conditions that approach the range, and the type of housing that will give health and vitality, keep the birds happy, contented and busy.

KANSAS COLONY HOUSE

Fig. 1 illustrates the portable colony houses used by Prof. Lippincott, of the Kansas Agricultural College. When the curtains are taken down during the summer, the front is almost entirely open. This house is well adapted to southern conditions. There is no necessity of using the curtains at all except as a protection from blowing rains when they could be called into use. The windows extend from the roof almost to the floor. This has a shed roof and is the same shape and size as the Fool Proof Colony House.

The wire mesh covering the windows is fastened to the outside of the studding before either siding or casing is placed. The casings for the door, windows, and side are placed over the sidings. If the ventilators were so arranged as to give the wind an upward drive, ventilators could be used where the sash are.

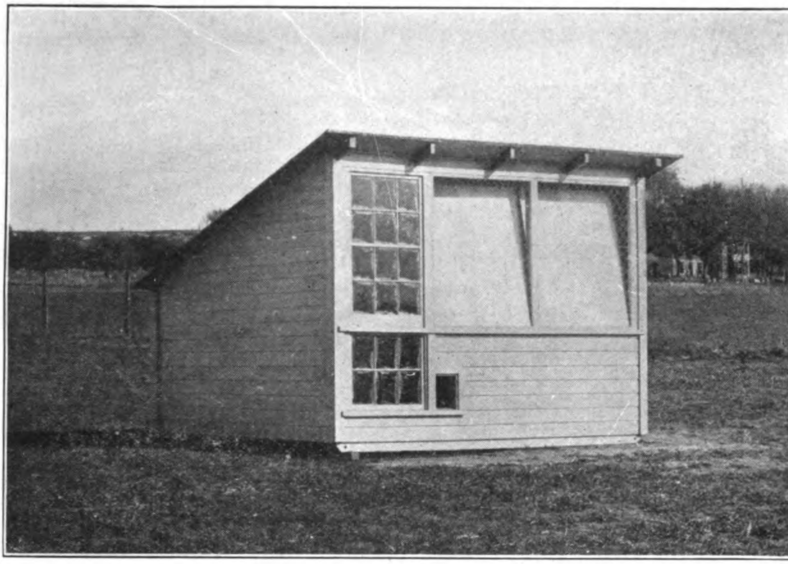


Fig. 1.—Kansas Colony House

OREGON COLONY HOUSE

Fig. 3. The house used by Prof. Dryden, Corvallis, Oregon, also, is on runners and can be moved by hitching a team to it. This house can be used in any mild climate. Curtains can be let down inside the wire front to protect the fowls from a storm. There are no windows in this

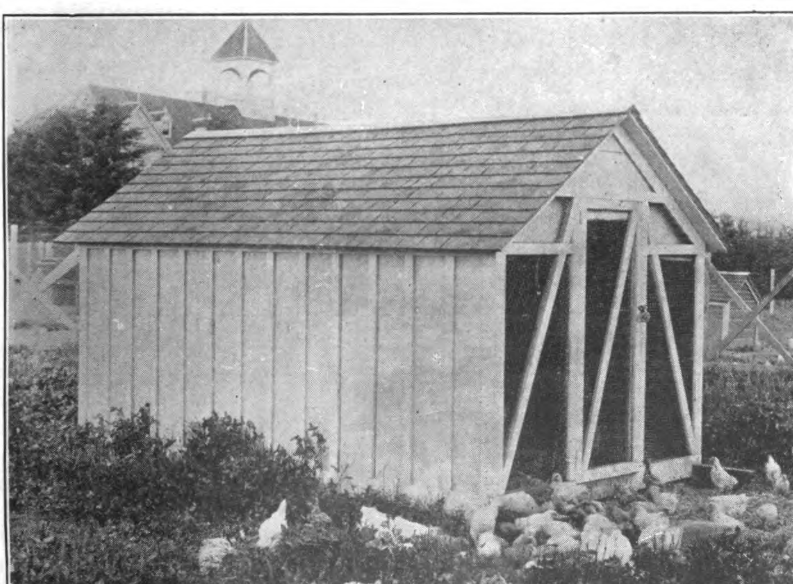


Fig. 3.—Oregon Colony House

house. The roosts can be put in the back end and the fowls kept some distance from the front. In any poultry house similar to this style roof it is usually best to have the entrance in the gable end of the house. This is a very simple and cheap house, suitable for mild climates.

Prof. Dryden suggests changes in this house, as follows:

"I may say that we are now testing a modified style of this house. We are making it still more open, having the side instead of the end open So far it looks as though it is an improvement. The open end house, however, has given good results, and it is in that house that we have secured our high egg records."

OWEN FARMS COLONY HOUSE

Owen Farms use and recommend an 8x8 ft. colony house for twelve laying hens or a breeding pen. The house is open front and, in a cold climate, if a male were placed in one of these houses he might get his

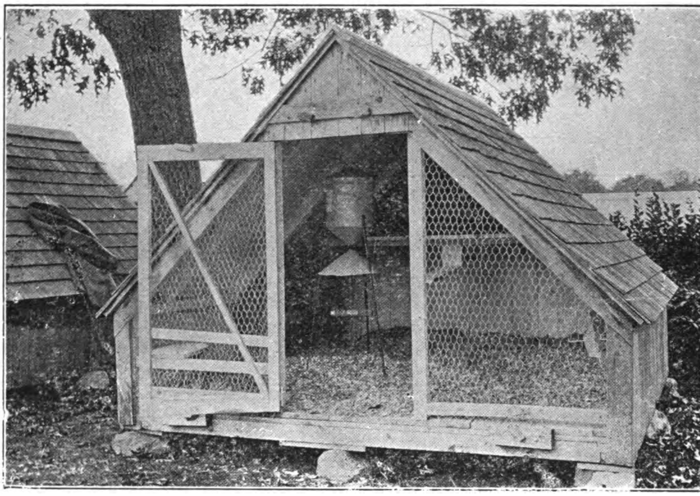


Fig. 53—Owens Farm Colony House

comb frozen, if not given some protection. The house is 7 ft. high from the floor to the peak and is 2½ feet high at the corners. The roost is hung from the rafters in the rear. You can see the nests in the farther left hand corner. This house may also be used for growing stock.

U. S. GOVERNMENT COLONY HOUSE

Fig. 4 represents the colony house in use by Prof. Harry Lamon at the Government Poultry Farm at Beltsville, Md. In illustrating several types, you can see the variety of opinions as to the best opening to be used in front. This house is well adapted to being moved, which is a decided advantage, as they need to be shifted often in the summer work. The ventilator, which is raised, protects the house from blowing rains and storms. This can be closed in winter. There is a window and an exit in each half of the house so that a partition may be put in the center, in case you wish to use the house for two pens or ages ofgrowing chicks, or for two pens of breeding stock. Temporary roosts and nests may be placed in all of these colony houses, if desired.

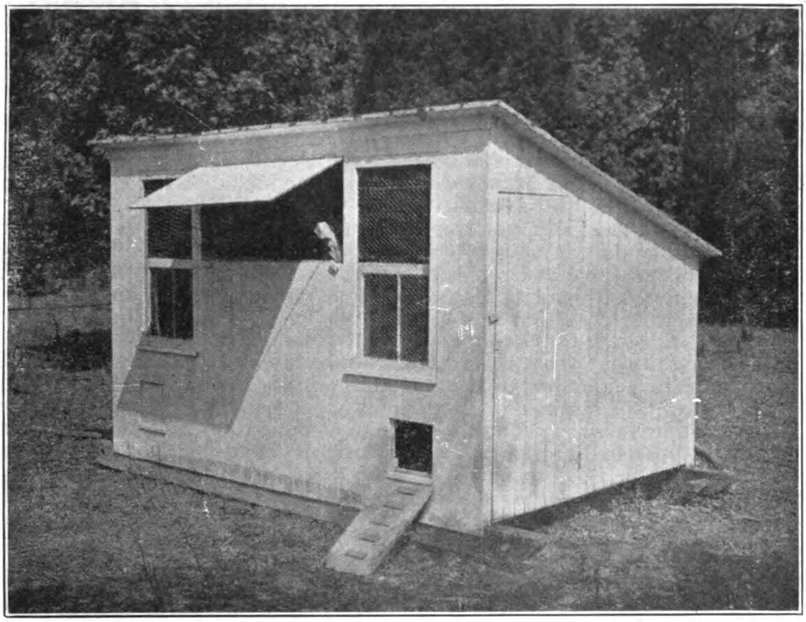


Fig. 4.—Government Colony House

OHIO COLONY HOUSE

Fig. 5 is the colony house used by Prof. Jacoby, of the Ohio Experiment Station. We believe, as a rule, these should have the door in the end

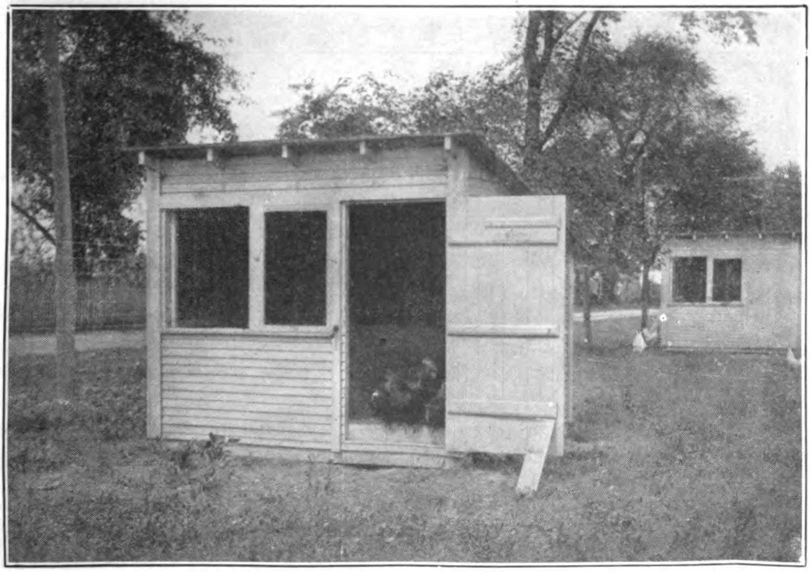


Fig. 5.—Ohio Colony House

of the house. The birds are not so apt to be frightened as they can shift to one corner to better advantage as you approach. It has been our experience that the glass in the front are broken much more often when the door is in the front of the house. This shows that the birds are more often frightened when the opening is in front than when it is in the end. And then, too, the doors will blow back and forth and break a window, if in the front of the house, especially if they are in the center of the front. The proper place for a door in a shed roof colony house is in the end. The siding material and method of construction is good, showing every indication of being substantially built.

In brooding chicks, if you expect to use the portable hovers, a colony house should be large enough to accommodate two hovers. If you plan to use a brooder stove and carry as many as five hundred to the flock you will be compelled to build a larger house, or pull two of the colony houses together and join them end to end, then put in a runway connecting them. This gives one room for the stove and one in which the chicks can eat and scratch and get away from the heat. A house 10x20 or 12x24 in size, with a partition in the center, will accommodate one stove of five hundred capacity until they are large enough to begin the work of culling them out. Many of the male birds should be placed on the market and you may, even then, be compelled to divide the flock if you have had good success in rearing the chicks. You must not crowd the growing stock, but allow them plenty of room, both in and out of the house. The growing stock can be kept right in these houses until maturity, and during the laying period if they are needed for that purpose. You then get the use of them the year around.

UNIQUE POULTRY PLANT OF J. V. McCONNELL, GARDEN GROVE, CALIF.

Fig. 61—Consists of "knock down" houses and removable fences. The sixteen houses, 5 and 6, shown in this picture, are held together with hooks and eyes and can be taken down on a moment's notice and moved to any other location. The fences are built in panels and they also, are held together with strong hooks and eyes. In other words, this entire plant, houses, fences and nest-boxes can be folded up in a half day's time by two men and set to one side so that a horse plow can be used in turning over the soil and perhaps planting it to some quick-growing, "purifying" crop

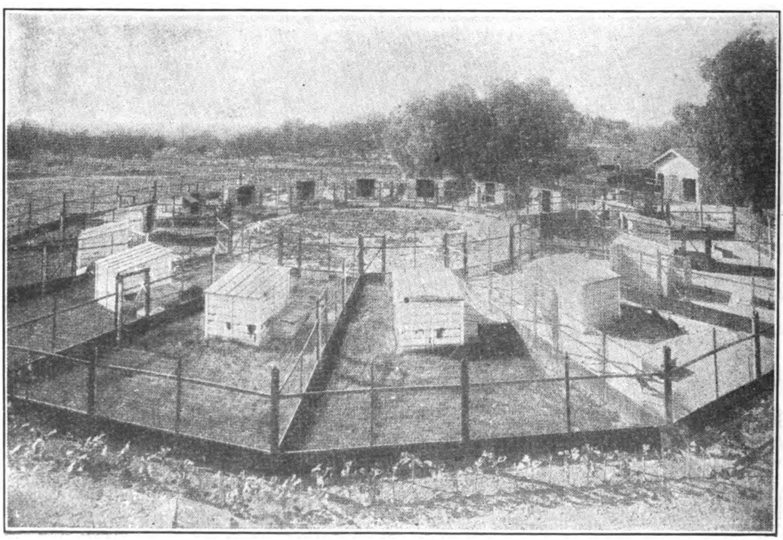


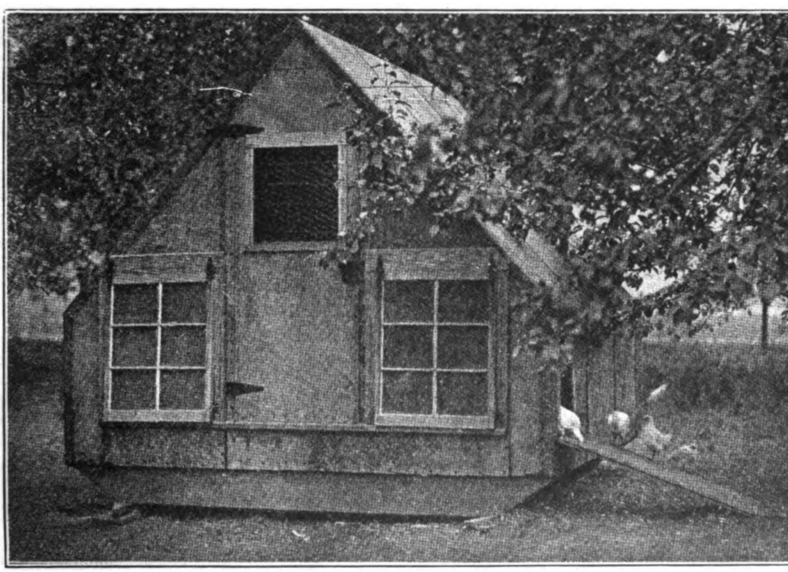
Fig. 67.—Courtesy of Reliable Poultry Journal

like barley, rye or oats. Kale is shown growing outside the outer fences. Kale or other green food is grown also in the central space. The attendant makes three trips in caring for the fowls kept on this plant. Entering through a lane that comes from the feed house at the right, he covers the small inner circle, placing wet or dry mash in the troughs shown at the inner, shorter end of each of the sixteen yards. To gather the eggs he starts at the same lane and makes the circuit of gates located in the division fences, just at the rear of the line of houses. For feeding kale (that grown outside the outer fences) he makes the long circuit, picking off the lower leaves of each plant and throwing them over the fences into the yards. We recommend this arrangement to fancier-breeders, especially on soil that is liable to get "sick" or become foul. The plan is attractive, economical and safe.

CORNELL "A" SHAPED COLONY HOUSE

Construction details of the improved New York State Gasoline heated colony brooder-house, as described by them in Bulletin 277, is as follows:

"The 'A' type of house is eight feet square, inside floor measure, has 24-inch side walls, and is six feet and six inches from top of floor to top of ridge board. The sub-framing is made and one or both floors laid before the upper part of the building is put upon it. The sills are 2x12-inch stock cut eight feet long. If desired, the ends of each runner can be leveled



(Courtesy of the Purdue University.) Cornell "A" Shaped Colony House.

so that the sills can be used as runners. An opening of 9½ inches by 12½ inches is cut in the rear runner to admit the burner box.

"The floor joists, four in number, are made of 2x4-inch stock, cut eight feet long, and are fitted into the runners with a half joint. This gives a strong sub-frame that is not likely to get out of square when drawn over uneven ground. After fitting the joints into the runners and securely nailing with 20d nails, the work is leveled, squared, and tied by means of a one-inch board nailed diagonally across the joints. The house can be stiffened by bracing each corner of the frame with a 2x4-inch brace running from the union of one joint with the runner to a point on the opposite joist at an angle to it. This is more desirable when the shed roof is used.

"There are three types of floor structure, single boarding, double

boarding throughout, and double boarding under the hover only. When using the latter two, the lumber should be planed and matched and of good quality. When building the double floor, cheaper and rougher material can be used for the sub-floor. This should be laid diagonally to help stiffen the building, then over a layer of building paper the finished top floor is laid, which should always be of good grade matched and planed lumber.

"The studs are now put up. These, together with the plates and rafters, are made of 2x2-inch clear hemlock stock. The studs are placed flush with the outer edge of the floor and are toe-nailed to it. The plates are laid on and nailed to the ends of the studs. The rafters are first nailed to the ridge-board and then put in place and toe-nailed to the plates. These are held in place temporarily by nailing a strip of board diagonally across them. The front and rear studs are fitted in place and then the boarding is put on. The boards are put on horizontally when the house is covered with paper, and are placed to overlap the floor four inches.

"The building is enclosed with seven-eighths inch matched siding, planed on one side, with the smooth side turned in. The boards for the sides and roof are cut in eight-foot lengths, and the ends are boarded vertically, thus making it possible to use 16-foot stock without waste. After the end boards and paper have been put on, the casings for the windows are nailed in place and the openings cut ½-inch smaller on each side than the dimensions of the window sash. By this method of construction no studs are required for the windows. The window casings are made of 1 1-8 inch lumber. so that the sash will fit flush with the side of the building, thereby avoiding the necessity of battens other than the ½-inch of siding left inside the casing.

"Best results have been secured by running the strips of roofing paper vertically instead of horizontally, as is generally recommended. It requires much less time to put on the paper and it presents a more pleasing appearance.

"The chick outlet is made through a trap-door cut in the floor, at the edge of the front runner and at the outer edge of a middle 2x4-inch joist. A runway with cleats supported at the upper end of the 2x4-inch joist leads to the ground at the endge of the house. The back of the runway is closed with boards, thereby keeping the chicks on the runway and making it possible to close them out fro munder the house. This is desirable until they have learned to return to the house of their own accord."

The galvanized iron heating outfit consists of a burner box to slide under the house, an iron drum, smoke chimney, and gasoline tank. This outfit can be purchased by writing to Cornell University, Ithaca, N. Y., who will furnish the name of the firm that sells the heating outfit. The heat is supplied by a gasoline burner.

FOOL PROOF COLONY HOUSE

We urge our students to adopt the Quisenberry Fool Proof Colony House illustrated and described in Lessons No. 2. You will find it one of the very best.

HOUSES FOR 100 HENS

The house for a hundred hens should be in more universal use than any other. It is a type suited to the needs of the suburbanite or the American farm. If every farm in America had this house as the minimum size for a laying house we would soon see an immediate increase in the wealth of the nation.

We are illustrating houses used in different sections so that you can make comparisons of these with the Fool Proof houses which we have illustrated and described, and select the one that you elieve will best suit your needs. We recommend the Fool Proof idea above all others.

THE MAINE HOUSE

About fifteen years ago, after concluding that the heated house was not practical, that Station began an experiment with the roosting-closets, which was one step forward toward the modern fresh air house. The space from the front edge of the platform up to the roof was covered by

frame curtains of drilling, similar to the one used on the front wall, except that it was not oiled. They were hinged at the top edge and kept turned out of the way during the day time, but from the commencement of cold weather until spring, they were closed down every night after the hens went to roost. The hens were shut in this close roosting closet and kept there during the night. They were released as early in the morning as they could see how to scratch for grain, which was sprinkled in the 8-inch deep straw on the floor.

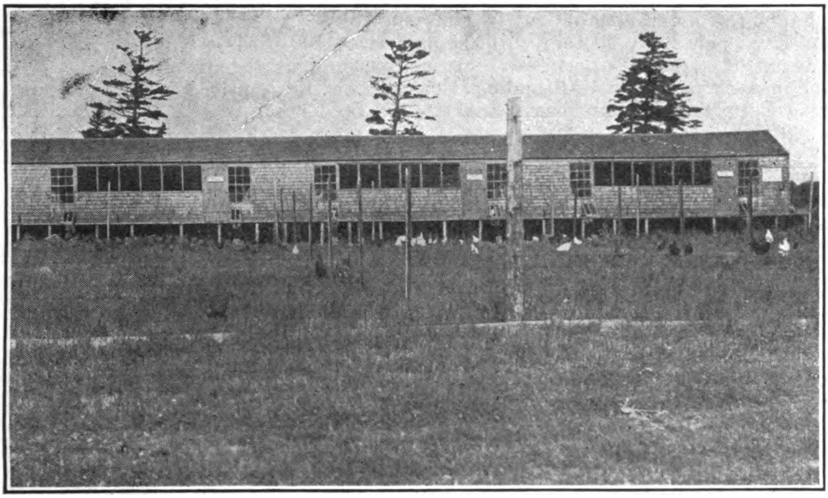


Fig. 55.—The Maine Experiment Station Poultry House

The building was used through five winters with 50 hens in it. The birds laid as well as the others in the large warmed house, their combs were red and their plumage brigh, and they gave every evidence of perfect health and vigor. This house was given the name of the pioneer house.

In trying out this experiment the idea was to retain the animal heat of the birds as well as to keep out cold. The great danger in this principle is that while the body heat is being conserved the birds are breathing the same air with which they started when the curtain is let down during the first of the night, consuming all of the oxygen and constantly emitting carbon dioxide. This lack of fresh air leaves the air very bad, which is plainly susceptible when the curtains are raised in the morning.

The conclusion of the Maine people is that "for some time past it has been felt that the roosting closet was at least unnecessary, if not, in fact, a positive evil. Consequently, the time of beginning to close the roost curtain in the fall was each year longer delayed. Finally, in the fall of 1910-11, it was decided not to use these curtains at all, and, during the winter the mortality was exceptionally low and the egg production exceptionally high. The roost curtain will not again be used at this Station." The closed in roosting closet has been displaced by the curtain front type of house in many sections.

Most of the Experiment Stations are using the curtain front but some of them, even in very cold climates, are advocating that there be one opening over which no curtain be used at all. These openings are so arranged that the wind cannot sweep through the house. Prof. Graham, of the Massachusetts College of Agriculture, has a house so arranged that he states no drafts can reach the birds and the maximum amount of fresh air is afforded.

We have considered the Fool Proof way of ventilation an advanced step in the fresh air principle, and that the shutter ventilation will suit

most of the climates of the country. Cornell University recommends a wind baffler, which is much like the shutter ventilator recommended by this school.

In extremely warm climates, it is better to have the front entirely open. The best results are obtained where the sun can reach the greater part of the house and the front so arranged that as much air can be obtained as if they were out of doors.

The following is a description of the Maine curtain front house:

"After several years of experimenting the following plan was adopted as being the most economical in construction:

"Each pen 20 by 20 feet will accommodate 100 birds. A house may be made up of as many or as few sections, or pens, as the owner desires. A door in each partition wall makes it easy to do the required work. In long houses, one end section may be left for a feed room.

"Three 6 by 6-inch sills run the entire length of the house. The center one supports the floor timbers in the middle of the house, while the outside ones rest on a rough stone wall, high enough from the ground for dogs and cats to go under the building to look for the rats, skunks, etc., that may harbor there. The stone wall rests on the surface of the ground, with large openings in it every 20 feet to allow the circulation of air. This keeps the ground and timbers dry during the summer. The floor timbers are 2 by 6 inches and on top of the sills. The front studs are 8 feet high, and those at the back are 6 feet 6 inches high. The two sides of the roof are unequal in width, the ridge being 8 feet from the top wall. The height of the ridge from the sill to the extreme top of rafters is 12 feet 4 inches. All studding is 2 by 4 inches. The building is boarded with 1-inch rough lumber, then papered and covered with rustic siding. The roof is covered with 1-inch boards and thin building paper and then shingled. The cost of the building may be lessened by using shiplap for the sides and by covering with a high-grade roofing paper.

"The front of the building, or of each section, has two storm windows 2 feet 11 inches by 4 feet 6 inches. These glass windows are screwed on uprights 2 feet eight inches from each end of the room. They are 3 feet above the floor. The distance between windows is 8 feet 10 inches, and the top part of it, to a depth of 3 feet 6 inches from the plate, is not boarded up, but is left open to be covered by a cloth curtain when necessary. This leaves a light wall 3 feet 10 inches high, extending from the bottom of the opening down to the floor, which prevents the wind from blowing directly on the birds when they are on the floor. A door 2 feet 10 inches wide, for entrance to the yard, is made in the front wall. The lower half is boarded, the upper being covered by the curtain. Another door 15 by 15 inches is placed 6 inches from the floor under one of the windows for the birds to pass through to the front yard. A similar door in the center of the back wall admits them to the rear yard.

"A light frame made of 1 by 3-inch strips and 1 by 6-inch cross is covered with either 10-ounce white duck or unbleached sheeting and hinged at the top of the front opening, which it covers when closed down. This curtain is easily turned up into the room and held in place by hooks in the ceiling.

"The roost platform should be made tight. It extends the full length of the room against the back wall and is 4 feet 10 inches wide and high enough to get under when necessary to handle the birds or clean out the house. There are three roosts, framed togethr in two 10-foot sctions. The top is 1 foot above the platform and hinged to the back wall, so they may be turned up out of the way when the platform is being cleaned. The back roost is 42 inches from the wall, and the space between the next two are 16 inches. They are made of 2 by 3-inch lumber placed on edge, with the upper corners rounded off. The roosting closet is shut off from the rest of the room by curtains similar to the one described for the front of the house. For convenience in handling there are two of these curtains, each 9 feet eight inches long by 3 feet wide, hinged at the top so as to be turned out and hooked up. This leaves a space 2 feet 6 inches between the curtain

and the roof. This space is ceiled and in it are two openings, each 3 feet long by 6 inches wide, provided with a slide door for ventilating the roosting closet when necessary.

"The nests are placed on framework under the roosting board. This frame should extend at least 3 inches beyond the back of the nests and should be so arranged that they may be easily removed for cleaning.

"If several of these houses are joined together to make one long laying house, a door should be placed in every compartment 5 inches out from the edge of the roosting platform. These doors are 3 feet wide and 7 feet high, dividing in the middle lengthwise and each half is hung with double-acting spring hinges, allowing it to swing both ways and to be kept closed without attention."

TOLMAN HOUSE

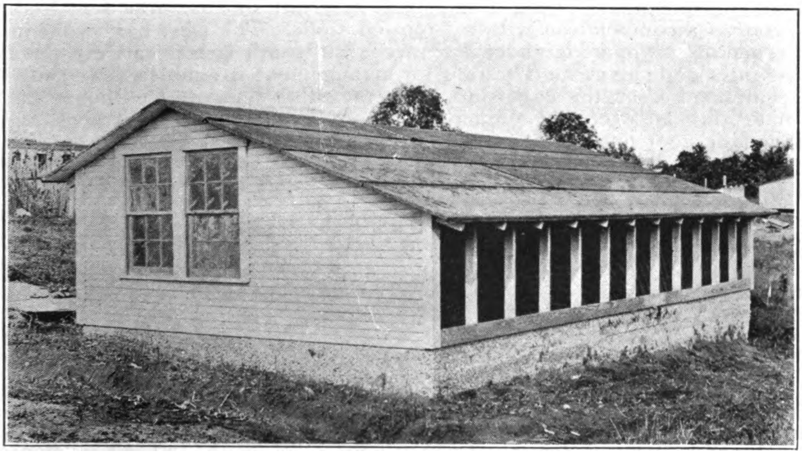
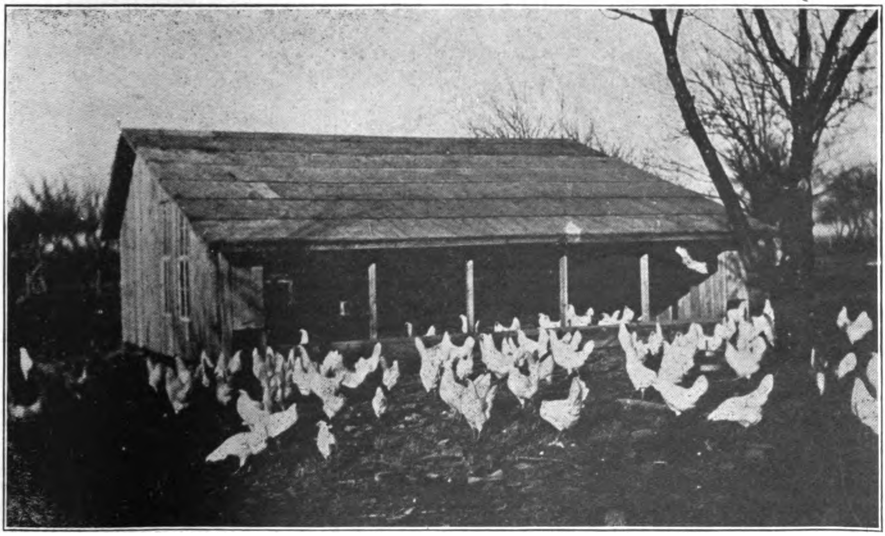


Fig. 6.—Tolman House



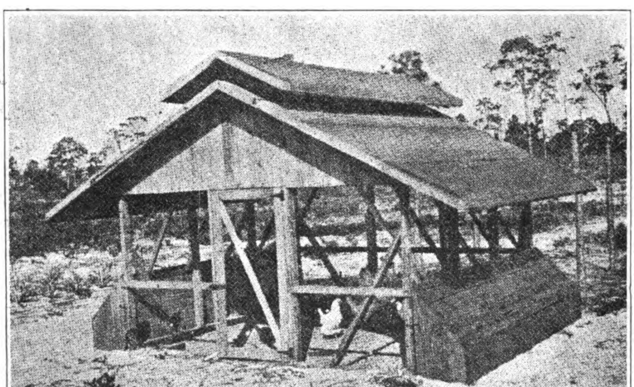
Tolman House, Missouri Experiment Station.

Fig. 6 is a Tolman house at the University of Missouri. It is adapted to use on the farm. It is not necessary to use any curtains over the front of the house, even in the northern section of our country. This house is not so well suited to a cold climate, as it will not admit enough sunshine and it is a warm house during the summer because the long slope of the roof is to the South. For this reason, we doubt the adaptability of the Tolman house to very warm climates.

The door is in the East side of the house, just opposite the windows. The windows should be hung on hinges, so that both windows and door could be opened in summer, or else entirely removed. A concrete floor is usually recommended for this house, but many use a dirt floor.

Prof. Kempster says of this house: "This type of house is especially adapted to Missouri conditions. The house should be as deep as it is wide. A house 20 feet square would hold 100 to 125 fowls easily. The north side is four and one-half feet high; the south or front side is three feet high. The roof is a combination with a 1-6 pitch slope. The west has two windows, making an opening about 4x5 feet. The south is left entirely open, both winter and summer. The interior arrangement is simple. The roosting equipment is on the back side, as in the other house. This house can be made into an excellent summer house by removing the windows and opening the door on the east end."

WARM CLIMATE HOUSES

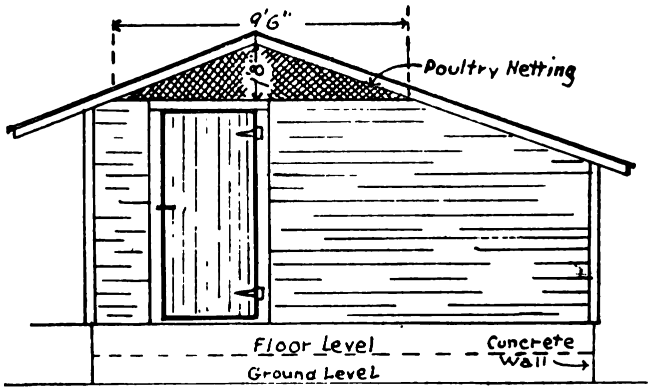


House for Warm Climate.

The house shown above was designed to use in very warm climates. The eaves of the house are made extra wide to furnish shade. The nests are built on the exterior of the house and rest upon the ground. The hens enter the nests from the inside. The upper portion of the roof is raised 6 inches or a foot from the main roof, which has an opening in it at that point, which prevents the heat from accumulating at the highest point. The frame work of the house is covered with poultry netting. The roost poles run crosswise of the house. This is designed principally for semi-tropical climates.

About the only thing needed in warm climates is protection from rain, sun, and enemies. A Fool Proof House, cheaply constructed and with almost an entirely open front, will meet every requirement. No detailed descriptions of these houses need be given, as their construction is of the simplest nature. A shed roof house with an open front and a projection on the roof, extending over the front of the house, to keep the sun from beating in, is as satisfactory as anything that can be used.

Cover the opening with one inch or one-half inch poultry netting to keep out sparrows and poultry enemies.



We show above the end section of a house for warm climates. The 18 inches in the gable end of the house is covered with poultry netting. You will note that the roof extends several feet over the front of the house, so as to present the direct rays of the sun from beating in upon the floor. This can be made to extend over even further than is shown. The entire front of the house is covered with poultry netting, and should also be provision made in the rear of the house for ventilation.

CORNELL LAYING AND BREEDING HOUSE

Fig. 7 represents the Cornell Poultry House with pens twelve feet square. Prof. Rice states that the size of the front curtain should vary in different sections of New York. In extremely cold countries a curtain 4 feet long and two and one-half or three feet high would be more satisfactory. For the warmer sections a curtain three feet four inches by six feet four inches is recommended. In using the Fool Proof house the size of the shutter should also vary with the climate.

The foundation of this house is built of concrete. A concrete wall 6

Fig. 7.—Cornell Laying and Breeding House.

inchesthick and 12 inches high is built above a trench filled with stones. The trench is 1 foot deep, except in a very cold climate and on a heavy soil, in which case it should be deeper. The concrete floor is two inches thick and consists of rough concrete, only.

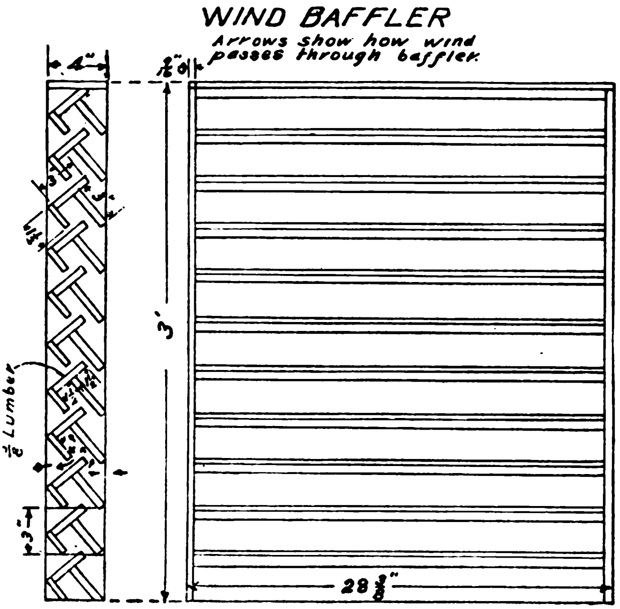


Fig. 71.—Represents the Cornell University Wind Baffler. It is similar to the shutter ventilator in our Fool Proof Houses, cut 27 inches long, nailed together in sets of three. Draw a pencil across the end pieces as indicated. The bafflers nailed through the end pieces into the end of the bafflers with No. 5 finishing nails. In warm climates the space for passage of air seems too limited.

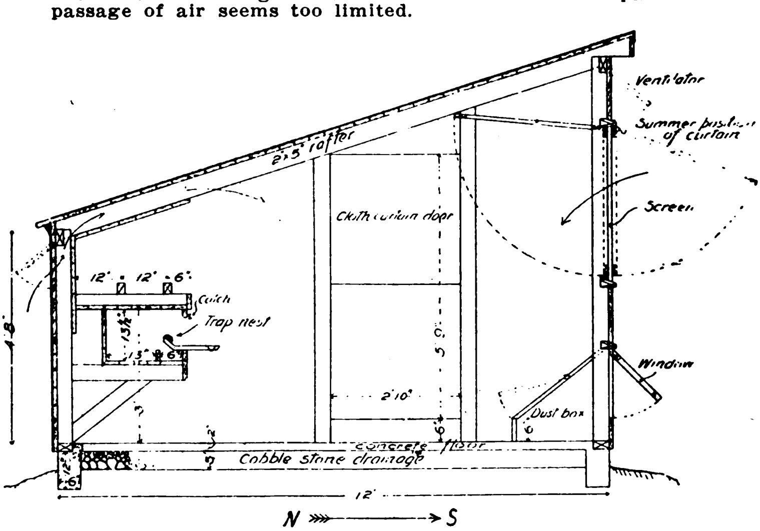


Fig. 25.—End view of House, 12 ft. sections as designed by Cornell University.

In many cases where the stone and gravel filling is very shallow or where the ground is very heavy and damp, it is well to insure dryness by using tar paper beneath the concrete or by adding air-slacked lime. When using tar paper, level, dampen and pound down the gravel filling. Sweep a light coat of clear sand over the gravel, so as to protect the paper from being cut by coarser parts of the ~ravel, and lay over this smooth surface one thickness of one-ply tar paper with edges overlapping one-half width of the paper. Over the tar paper spread the 2-inch layer of rough concrete, as described above. In addition to preventing the upward passage of water, the tar paper prevents the downward passage of heat, thereby providing a warmer floor.

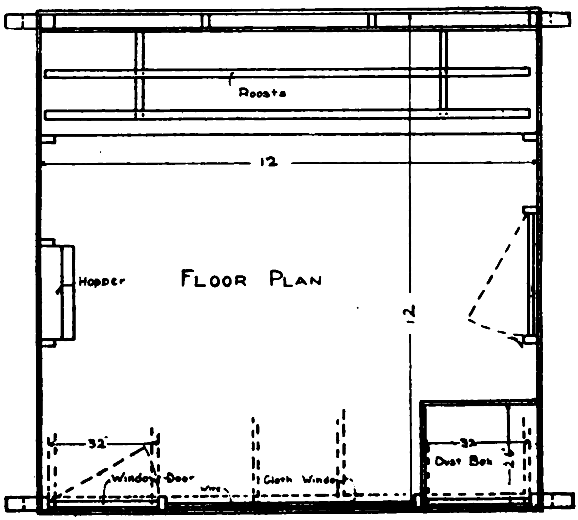
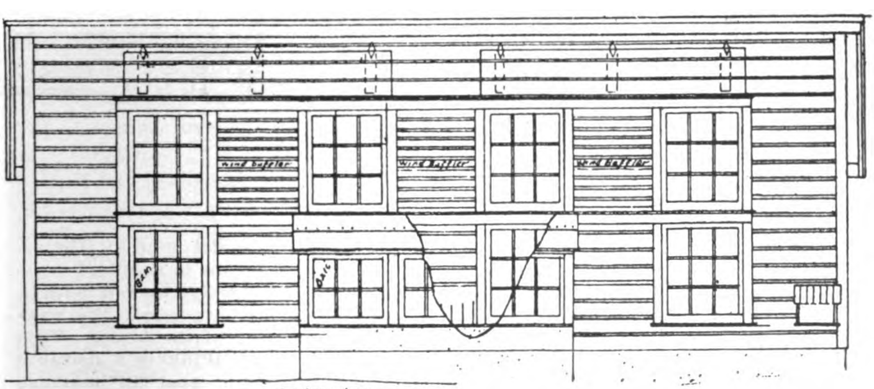
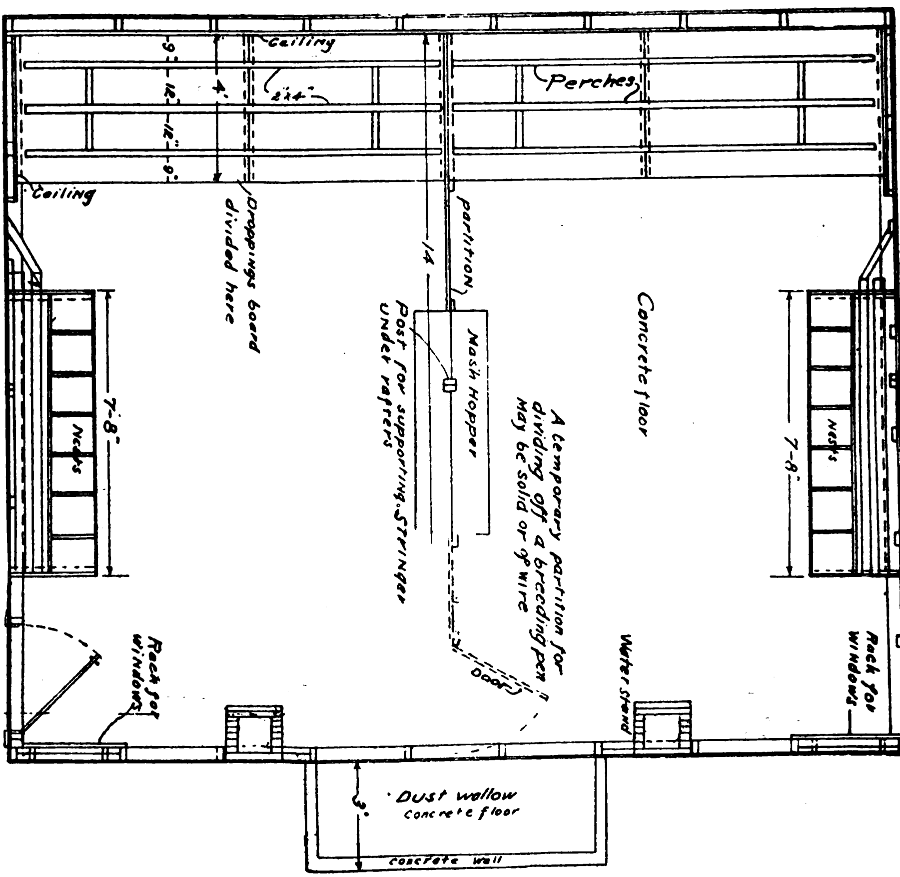


Fig. 25 A.—Floor plan of the Cornell House, 12 ft. sections.



The front elevation of the Cornell Model Poultry House. This shows the arrangement of the windows with the wind bafflers in place between the open sash. You can also see the large ventilating space made in the boards just beneath the eaves, which can be raised and hinged outward.

The house is ventilated in the winter by the cloth curtain; in summer by a small door at the top of the back side. The muslin curtain is hinged on the outside and fastened up to serve as an awning during the summer months. Cornell University is now building practically the same kind of a house and, instead of the curtain for ventilators, uses and recommends wind bafflers much the same as the shutter ventilators in the Fool Proof Houses. There is no question but what that is the best system of ventilation for poultry houses in most climates.



We here illustrate the floor plan of the Cornell Model Poultry House. The particular feature that I wish to call to your attention is the dust wallow, shown in the front of the house. This dust wallow is covered with a shed roof and there are three windows in front of same to admit the sunlight. The hens may enter the wallow from the interior of the house. This confines the dust more or less to the outside, which we think is a dsirable feature. We do not like to provide for such where it will cause an immense amount of dust to accumulate on the drinking water, feed hoppers, troughs, and other equipment in the house.

Fool Proof Coloney Houses used by the American Egg Laying Contest, showing the shutter front.

HOUSING QUESTIONS FOR LESSON NO. 3

1—Will it do to apply the same principles in housing hens as you would in housing carnations or roses? Mention some difference.

2—Does it ever pay to remodel old poultry houses?

3—What are the advantages of labor-saving devices in housing poultry?

4—In connection with ventilation, what two important facts must be considered?

5—What is the best size of glass to use in a poultry house?

6—Which is regarded as the best method of hanging windows as shown in Fig. 22?

7—Name the best method of hanging doors as shown in Fig. 23.

8—What are the disadvantages of a dirt floor?

9—What is one of the chief points to keep in mind when building a movable colony house?

10—Why is an alley in a poultry house unnecessary?

11—Name the requirements of fresh air for poultry, man and cattle.

12—Discuss, briefly, the laying out and squaring up the floor of a poultry house.

13—What is the most economical type of colony house?

14—Where is a good place to locate a colony house on a farm?

15—Which of the colony houses illustrated do you consider the worst? Why?

16—Which do you consider the best of the colony houses? Why

17—What is the danger of the old style roosting closet?

18—Why would you not recommend the use of the Tolman houes in a hot climate?

19—What does Cornell recommend as a good method of constructing a concrete floor to insure dryness?

20—What disadvantages can you see in the Cornell Wind Baffler?

MINNESOTA HOUSE

Fig. 8. This is an illustration of the broken span type and can accommodate a large farm flock. This house is used at the University Farm, St. Paul, Minn.

In many mild climates this house can be used by omitting the curtain in the front. Every farmer or small breeder should have a select pen of the best hens he has, mated to a bird of known pedigree, so that the flock will not remain at a standstill, but grow constantly better each year. A pen can be divided off in this house by the use of a temporary wire partition, and a fence made in the rear for them to run in a separate yard. Please notice that the long span of roof is to the north. Also note the front arrangement for sunlight and ventilation. The rain will run toward the front and beat into a house with a roof like this.

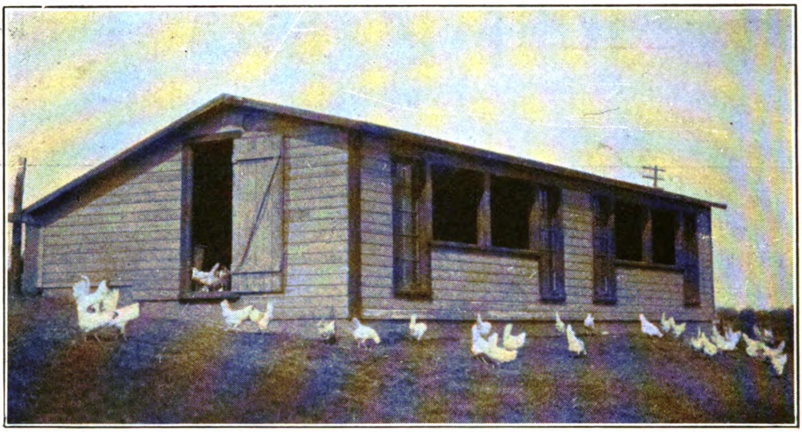


Fig. 8.—Minnesota House.

Prof. Smith says of this house:

"I believe in much smaller openings for ventilation than the one shown in the illustration, and I also believe in covering these with burlap instead of muslin. My idea is to provide just sufficient circulation to carry out the moisture without letting out too much heat. To put it briefly, I think that a small opening covered with burlap on the outside of the building and so arranged that this opening may be closed tightly when the thermometer drops ten or twenty below zero, together with windows, the upper sash of which are hung on weights and pulleys, so that they may be adjusted to the wind and weather each day, is the best plan upon which to construct a polutry house in this climate, when winter laying is the object in view."

MASSACHUSETTS HOUSE

Fig. 10 is a house used by Prof. Graham, at the Massachusetts Agricultural College Experiment Station. A small pen is partitioned off at the right end of the house to accommodate a pen of choice breeders.

The openings being narrow in the center do not permit such a sweep of the cold wind through the house. During the warmer weather the two small curtains can be taken down. They can be fastened up by buttons, or they can be taken down, which does not permit such an accumulation of dust.

You will note that there are no windows in this house.

Prof. Graham describes this house as follows:

"It is 18 feet deep and 24 feet long, which gives floor space sufficient for 100 hens.

"The cloth at each end of the opening is nailed to frames made of ma-

terial 3 inches wide and 7-8 inches thick. These are kept in place by buttons on the inside. The rest of the opening 10 feet by 5 feet, is covered by inch mesh wire. The birds are resting so far from the opening that they will not suffer in cold weather, when the house is sufficiently filled.

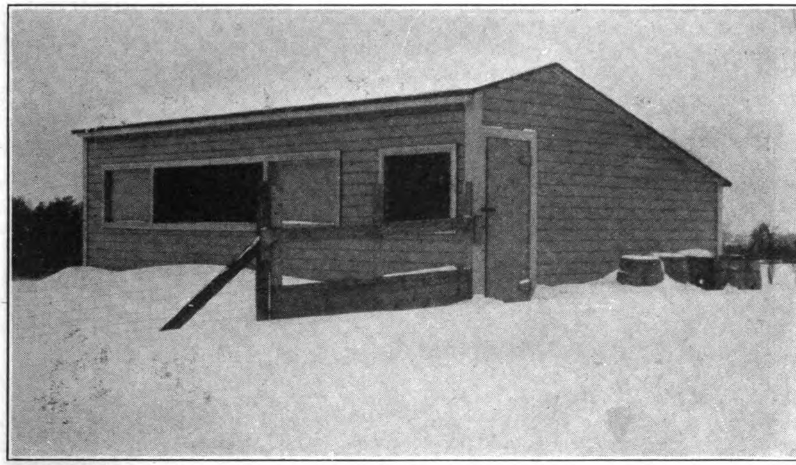


Fig. 10.—Massachusetts House.

"The height of the front is 7 feet 10 inches and back 4 feet 10 inches. A 2x4, 12 feet long, sawed in two, will make the back stud 4½ feet and the front one 7½ feet. The rafter at the rear is sawed off flush with the back edge of the stud and plate, and the rear roof board is allowed to project over about 3 inches with a small strip nailed up underneath it on the outside. The boards used on the outside are novelty siding, with no paper.

This house is designed for a single pen, or a section of a long house. We made it 30 feet long with a partition 6 feet from the east end, giving us a detention pen 6 feet by 18 feet. This pen is our laboratory for studying our flock. Every poultryman should have one. Note that a 4x4 beam supports the center of the roof."

THE LeGEAR POULTRY HOUSE

Dr. LeGear builds all of his houses up on posts, leaving a space of about two feet under the floor so the chickens may have the use of same. We give his own views of housing in his own words, as follows:

"We do not believe in expensive poultry houses, but they should be dry, comfortable, free from drafts in cool or cold weather, and still admit plenty of fresh air at all times. We are using but one style of poultry houses on our poultry plant. They are all the open-front fresh-air houses, all face the south and are built up off the ground on posts, and the space under the houses affords excellent protection for the fowls during the hot summer days.

"Our houses are sixteen feet deep and are divided, by a wire partition and screen door, into divisions ten feet wide. We keep deep, clean litter on the floor during the winter and scatter all grain feed in the litter, which gives the hens exercise scratching for it. Each of the divisions will accommodate forty hens very nicely. We use ordinary number three sheeting on the rafters and two-ply roofing on top. The roofs are all shed roofs and slant one way—to the north. On the walls we use the number two boxing, with bats on the cracks on the outside, and line the inside with twoply roofing paper. There is an opening in each division on the south four by five feet, which admits fresh air and sunshine. We have a separate run twenty by two hundred feet for each division of the houses and have the space under the houses partitioned to correspond to the partitions in

the house above. There are double floors in all the houses. The under floor is common sheeting, while the top floor is tongue and grooved flooring. All of the houses are eight feet high in front and six feet in the rear. Three roosts are constructed on a level eight inches above a four-foot

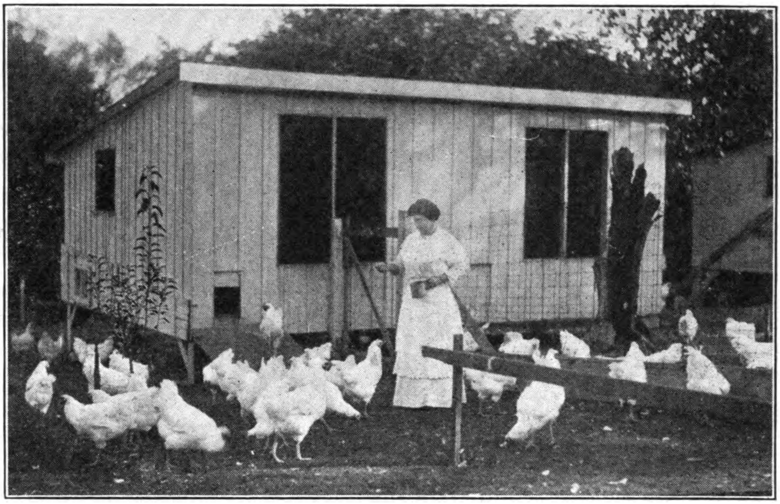
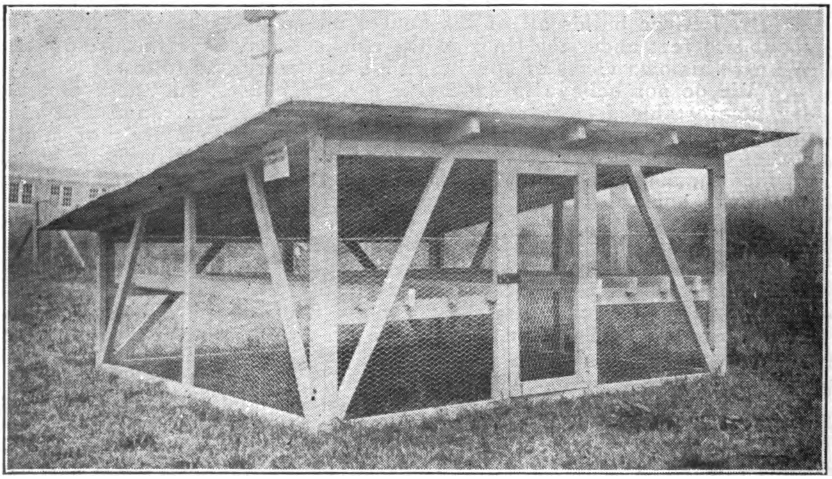


Fig. 56.—The LeGear Poultry House

droppings board across the north side or end of each division. The droppings boards are about twentyfive inches from the floor and the nests are under the droppings in a dark place. By the houses being up off the ground we have never been bothered with rats. The floors are always dry, can be cleaned, mopped and disinfected. We have nevr, as yet, found any dampness or moisture in these houses, and have had some of them in use several years."

CHEAP SUMMER HOUSE

This is a summer house for growing stock or one which can be used



Cheap Summer House.

in warm climates. The size is about 10 by 12 feet, 7 feet high in front, and 5 feet in the rear. It is made of 2-inch framing material or even lighter material is better. The roof is made in three or four sections, running lengthwise of the house. The roofing boards are covered with composition roofing material, so tacked that it overlaps the joints in the sections o fthe roof and prevents leaks. The roof is held to the frame by hooks and staples so it may be removed. The house is built in sections, the front, back and ends all being separate and individual parts. They are all bolted together with bolts, but can be easily taken apart and moved in sections. The door is in the corner of the front and opens outward. The entire frame is covered with poultry netting. The space in front of the door is open the width of the door and the attendant can easily pass from the front to the rear of the house. The roosts are on each side of this passageway and run from the front to the back.

THE MISSOURI HOUSE

Prof. Kempster, of the Missouri University, has designed and recommends this house, as follows:

"This house is 20 feet square, the square house being the most economical to construct and affording a maximum amount of floor space. The ridge of the roof runs north and south, the roof being of equal spans. The walls are five feet at the eaves. It is eleven feet high at the peak. The south side contains a door in the center and a window 2x3 feet on each side of the door. These windows are placed high enough to afford a thirty-inch opening beneath, one foot above the floor and extending the entire length each side of the door. This opening is covered with wire screens which keeps the hens in and the sparrows out.

"On the east and west sides are two windows, each 2 feet high and 3 feet wide. On the north end next to the floor is a six-light 8x10-inch glass window. An arrangement which admits light from all directions has decided advantages, because the light is so distributed that there are no dark corners, thus discouraging the laying of eggs on the floor. Also, when light comes from one direction the hen always faces in that direction when she scratches. In consequence, there is a gradual movement of the litter toward the back side of the house. When light is evenly distributed this trouble is eliminated. One hen scratches one direction and another in

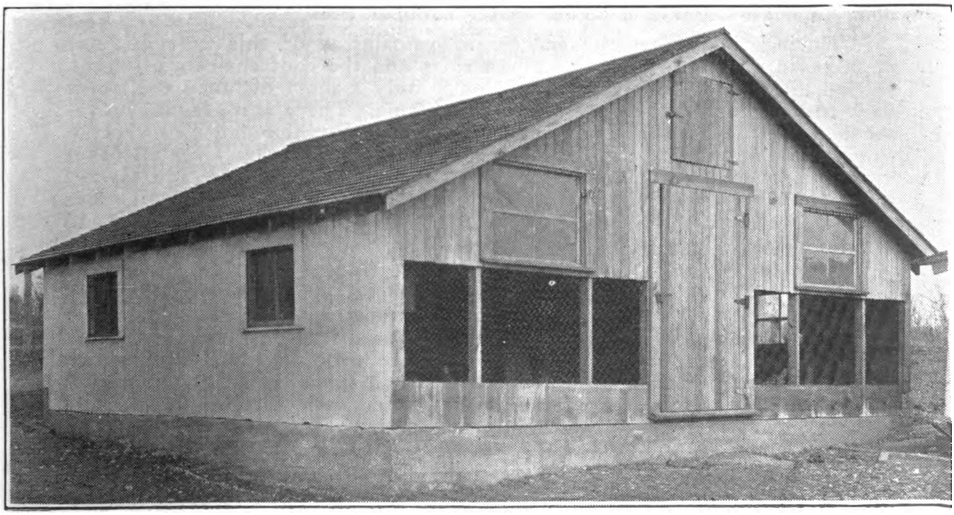


Fig. 69.—The Missouri House.

another and the litter never piles up on the dark side of the house, because there is no dark side in such a house.

Another decided advantage in having openings on all sides is the excellent summer ventilation which can be afforded by removing the win-

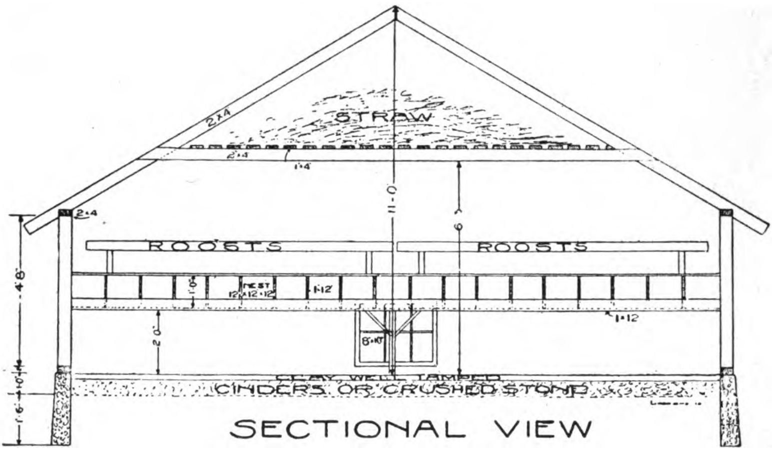


Fig. 70.—Sectional View of the Missouri House.

dows. This is an important point. Summer ventilation is as important as winter ventilation.

"The walls are of car siding, running up and down, which forms a tight and attractive wall. The roof is made of shiplay covered with shingles."

Joists or cellar beams are placed in the house just high enough to afford head room. In order to prevent the birds from roosting on these, they are covered with inch boards, four inches wide placed two inches apart. This forms a loft which is filled with straw. The straw acts as a sort of sponge by absorbing both dampness and heat and helping to keep the house drier in winter time and cooler in the summer time.

"During the winter the success of ventilation of this type depends upon having the east, west and north sides and the roof entirely air-tight, so that the wind will drive into the house only a short distance and never back to the roosts, which are on the north side. There is a gradual movement of the air from the inside out, thus insuring an abundance of ventilation without drafts. Open-front ventilation has an average over all other ventilation because it requires no adjusting, never plugs up, and always works. This type of ventilation will adapt itself to temperature changes without the constant attention of the attendant and in this way reduces to a minimum the labor of caring for the house."

"The roosts should be at the back or north side and all on the same level. They should be four feet above the floor, 14 inches from the wall, and 12 inches apart, and made of 2x4's with rounded corners. Poles two inches in diameter, if firmly placed, will serve the purpose nearly as well. Eight inches beneath the roosts is placed the droppings platform, which keeps the floor clean and increases the floor space for other purposes. Underneath the droppings platform are placed the nests. There should b eight inches of roosting place for each bird and one nest for every six or seven hens."

In most sections it will probably cost about $120.00 to build this house, aside from the painting. It will accommodate from 120 to 175 hens, depending in part on the breed, making the cost about $1.00 per hen or a little less."

Bill of Materials

Use	Pieces	Size	Bd. Ft.
Rafters	22	2x4-12	176
Plates and sills	8	2x4-20	107
Studding and frames	1	2x4-10	7
Roosts	5	2x4-20	74
Finishing	6	1x4-10	20
Finishing	1	1x4-16	6
Finishing	4	1x4-10	14
Finishing	8	1x4-12	32
Floor for loft	52	1x4-14	260
Car siding for walls	—	1x6-10	600
Shiplap for roof and drop. plat	—	1x8-12	720

Shingles—5½M.
Sashes—7 6-light, 8x10-inch glass.
Wire netting for windows and front—3x32.
Hinges—1 pair.
Foundation—3 cu. ft. of concrete.

We especially recommend this house to our students in climates that are extremely cold. We would cover the front with burlap or cloth of some sort, tacked to frames which are hinged at the top of the opening for ventilation. We would cover the walls on the sides and rear of the house with plaster board, using it on the inside, and put straw in the loft, for additional protection against cold. Then, I would use a galvanized iron or wooden ventilator in the roof, near the center. Make these changes in the plans as shown above, and, when you have done this, you will have a house that is ideal for extremely cold climates. You can alter the size of the house to meet your requirements.

SEMI-MONITOR TOP POULTRY HOUSE

Fig. 27. A house of this kind, 10-14 feet deep, can be built for about $35.00 to $50.00, and it will accommodate about thirty-five layers. A house built on this plan, 10x20 feet deep, will accommodate about seventy-five or eighty hens. This house can be built as a long or continuous house, and divided into pens or sections. The south side of this house is boarded up eighteen inches from the ground and six inches down from the top and the balance is left open and covered with one-inch mesh galvanized wire, with a curtain hinged on the inside. You should put three small windows in the monitor top and hinge them at the top, so they can be raised in hot weather. These windows let in sun to the back part of the house.

If you build this house as a large laying or breeding house, the floor dimensions being fourteen feet wide by twenty feet deep, the highest point of the roof should be ten feet and the rear section should be twelve feet deep. Make the front section eight feet deep the same height as the small house. The actual opening in front is about two and one-half or three feet high and the entire width of the house. The joints, where the roof

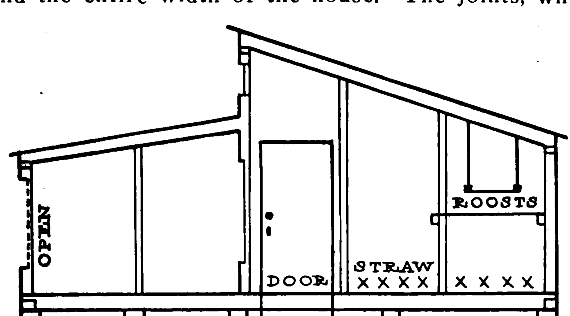


Fig. 27.—Wood's House.

is attached to the side wall, should be made absolutely wind proof, and if the north and west side of this house are covered with rubberoid or asbestos, or some roofing material, it will make it much warmer and more comfortable in winter. The window in the west side should be placed directly opposite the door in the east, and during the summer months these should be taken out entirely and covered with screen wire. A sliding shutter door can be made to cover the opening where the fowls enter the house, and this shutter run on cleats and raised and lowered by a cord and pully from the rear section of the house.

The house, which is built ten by fourteen, should be eight feet high at the peak, six feet at the back, five feet six inches high at north end of the front section and four feet six inches at the front, and should be boarded down to the ground. This house is generally known as the Woods type of house, having been designed by Dr. Woods.

Extending across the building and through the center of the doorways, a track of wood or iron may be placed for the ready movement of a suspended car. The platform of this car should be 2 by 8 feet and elevated about 1 foot above the floor. Attached to each end of the platform is an iron guard which projects one feet beyond. As the car passes through the building this guard strikes the door and pushes them open easily. All food and water can be carried through the house on this car and it will prove a great labor saver in a long laying house. The droppings from the roosting boards may also be removed on it, being gathered in pails or boxes, loaded on the car, and pushed to the manure shed.

The Woods house is so designed as to permit the maximum amount of sunlight, but one trouble about the placing of the windows in the top of the building is that the warm air rises and when night comes on the air rises to the top of the building where it is cooled from the outside by the cool air which causes much condensation and moisture and makes the house more or less damp. However, this defect can be remedied, to some extent, in this type of house by using cloth instead of glass in some of the

Fig. 27.—The Dr. P. T. Woods Open Front House.

sash of the upper windows. The aid that rises should then not be condensed by the outside air. This house is a failure in some climates, without this precaution.

THE CONNECTICUT HOUSE

Fig. 58 represents the house used in the International Egg Laying Contest at Storrs, Conn. Twelve feet square, 6 feet high at the eaves, 8 feet at the back, 24 square feet of open front provided with curtains, 12 square feet of glass consisting of a window at either end.

Prof. Kirkpatrick states that "This poultry house, with a slight modification, that is to say, with the removal of the partition, making it only one pen, is certainly an excellent house for a small poultry breeder, that is, the man with 25 or 30 hens. By making the house 16 by 18 feet square you could make it large enough for 50.

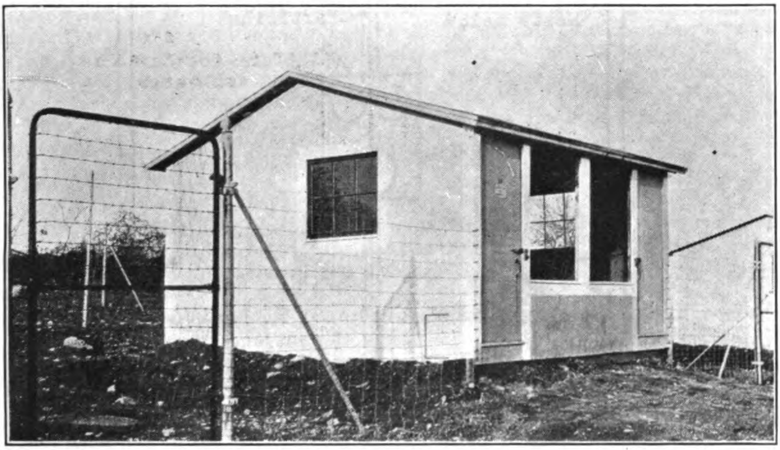
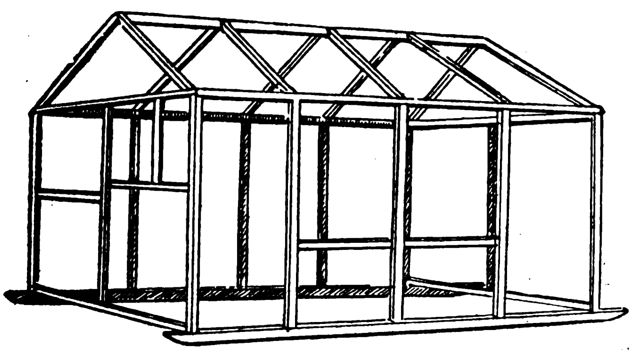


Fig. 58.—Connecticut House.

The thing which we do not like about this house is the fact that the roof slopes to the front. Rain and melting snow, as they drip from the roof, are likely to blow into the openings in the front of the house and cause the floor to be wet and the house damp.

Professor Stoneburn was in charge of the work at Connecticut when these houses were built, and the following is his description of them as contained in the Philadelphia North American:



Framing Plan

Fig. 59.—Connecticut House.

"The original houses were twenty feet square and occupied by a single flock of birds. For the purposes of the laying competition such large structures were not needed, and each house had to accommodate two flocks of layers. Accordingly, the original plan was photographed down and the layng competition houses made twelve feet square. Otherwise, the general plan was closely followed, save in the matter of a central partition, which divided each house into two equal pens. This smaller house will be described in detail and it is illustrated in the accompanying cut. The dimensions are as follows:

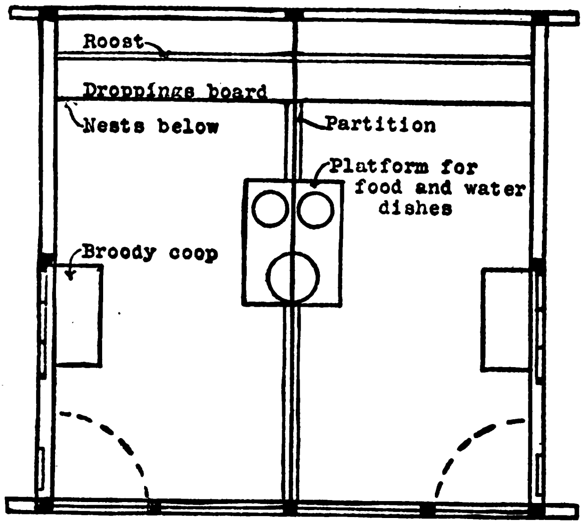


Fig. 60.—Floor Plan of Connecticut House

Front, back and sides .... 12 feet long
Height to eaves .... 6 feet
Heights to peak.................................... 8 feet
Roof, even span, sloping north and south.

Materials used—
Skids, 3x6 inches.
Sills, 2x4 inches.
Studding and rafters, 2x3 inches.
Siding, 7-8 inch matched lumber.
Painted two coats oil paint.
Roof covered with prepared roofing.

Inside Walls Smooth and Clean

"All dimension stuff dressed four sides and siding dressed two sides, so inside walls are tight and smooth.

"A square building with a given amount of floor space is more economical than a long, narrow building of the same capacity. For instance, this twelve-foot square house has forty-eight running feet of side walls and 144 square feet of floor space. A building twenty-four feet long and six feet wide has sixty running feet of side walls, twelve feet more than the square house, but the amount of floor space is the same in both cases.

"Now consider details of construction. A single sash window is placed in each end wall, arranged to slide toward the front of the building between the end plate and a girt placed at the proper distance from the plate. The rear edge of each window comes directly beneath the peak of the

roof. The small doors for the hens are also located in the ends of the building, well forward to avoid draughts across the floor.

"In the front of the building are two solid doors, located at the corners and swinging inward. These are 2* feet wide and extend from a point slightly above the sill to the plate. The idea is to have the lower edge of the door sufficiently high to swing clear of the litter on the floor.

"The space between these doors is boarded up two feet from the bottom and the balance covered with wire netting. This low front wall serves to protect the birds from the wind during unfavorable weather. Two cloth-colored frames of proper size to fill the large opening are hinged to the plate. These are usually swung up against the roof, but may be dropped as occasion requires. By properly spacing the rafters it is possible to swing the frames up between them, which largely prevents the accumulation of dust on the cloth. The accompanying framing plan clearly shows how the various members of the frame are placed, excepting two pieces which extend across the building in the center, one between the sills and the other between the plates.

"The 'sideboards,' upon which are placed water dishes and dry mash receptables, are slat frames attached to the central partitions, some eighteen inches above the floor. It will be observed that none of this equipment occupies any floor space, so the fowls may use every square foot of the floor for exercising.

Floor of Earth or Boards

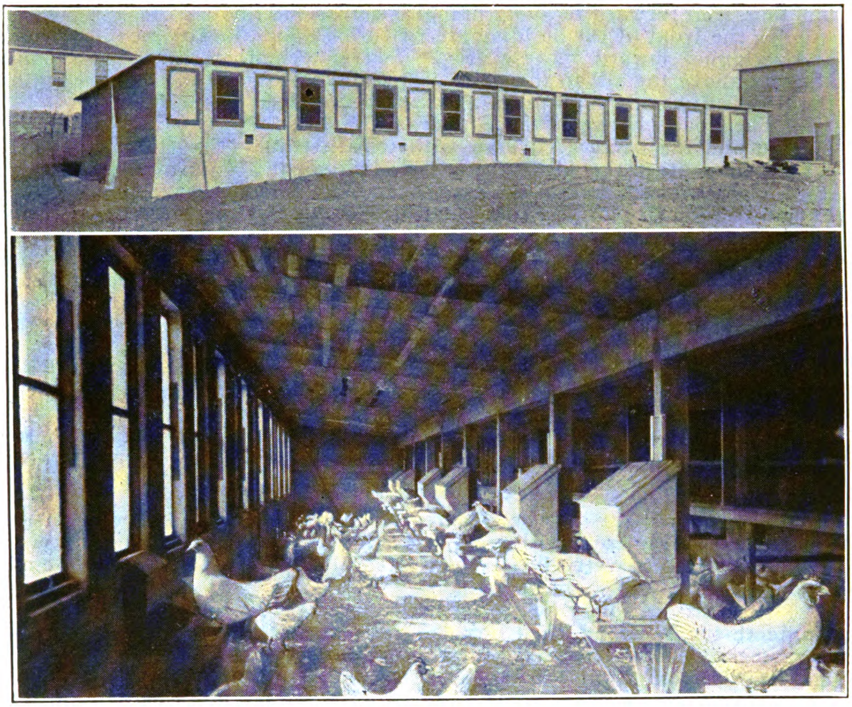
"The floor itself may be either earth or boards, as preferred. In the case of the laying competition plant, earth was used. If the building is to be moved at comparatively frequent intervals, a board floor would be advisable.

"In most sections of America it is sufficient to make the walls of a single thickness of matched boards. However, it is a good plan to take any necessary steps to prevent the slightest draught across the roosts which may result from small cracks. The rear wall from droppings board level to eaves may be covered with heavy building paper or prapared roofing, nailed on the outside or used for lining, as may be preferred."

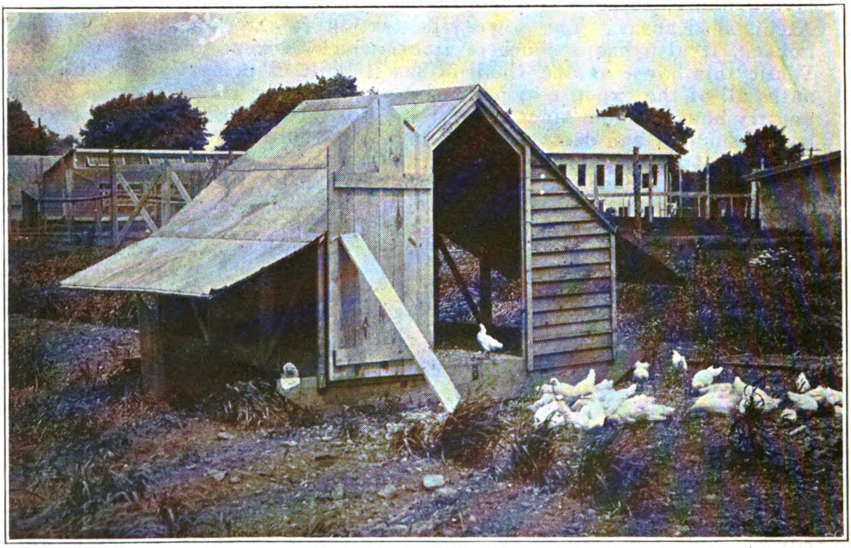
CONCRETE AND HOLLOW TILE HOUSES

In the upper illustration is shown the exterior of an all concrete laying house, 16x80. This house is used on the Challiss Egg Farm, at Atchison, Kansas. The lower illustration is the interior of the same house. It also has a concrete floor, which is kept covered with litter. While this house as Mr. Challiss has it built, is perfectly dry and eliminates all of the expense of paint and repairs, yet a solid concrete or stone poultry house seldom gives satisfaction, for the reason that they are usually hot in summer and damp and cold in winter, unless they are properly ventilated. Mr. Challiss has air vents or intakes, which are built in the concrete pillars and supports at the rear of the house. Then the windows in the front are raised and lowered so that there is a circulation of air, which keeps the house dry and more or less uniform in temperature. Unless you have had considerable experience with concret work and with the proper methods of ventilating such houses, it is a dangerous matter to construct same for poultry. However, all of the buildings on this particular farm, even the fence posts, are made of concrete and all are giving satisfaction. Hollow tile houses are safer and more satisfactory in the hands of the average man than is concrete. Hollow tile can be easily ventilated, and such a house is cool in summer and warm in winter. We recommend hollow tile where it can be purchased at a reasonable price.

We have here a small Colony House for brooding growing chicks. This house does very well in warm climates, for the reason that the front can be opened up and the sides of the house are hinged and may be opened as shown in the illustration. This makes the house very cool, and it affords protection from the sun. The framing material on each side is covered with poultry netting, so that the boards on the side may be raised and the chickens still confined to the house when necessary. This house

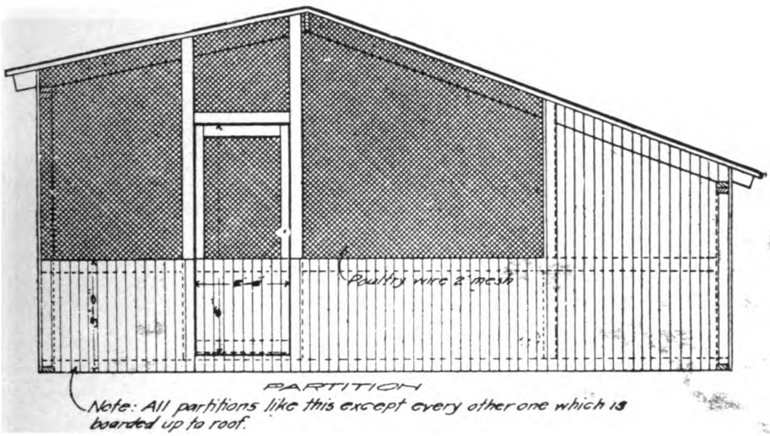


An All Concrete House.



Summer Colony House.

can be built of any size that is desirable, but it is not necessary to build it any higher than just enough to furnish head room and for the convenience of the attendant.



An Idea for Partitions.

Every other partition in a poultry house may be constructed somewhat after the style of the above. The first three feet from the front is boarded up solid to preveent the males from fighting. The same is true above the roosts. The remainder of the space is covered with poultry netting. This is reproduced from U. S. Farmers' Bulletin.

CANADIAN POULTRY HOUSES

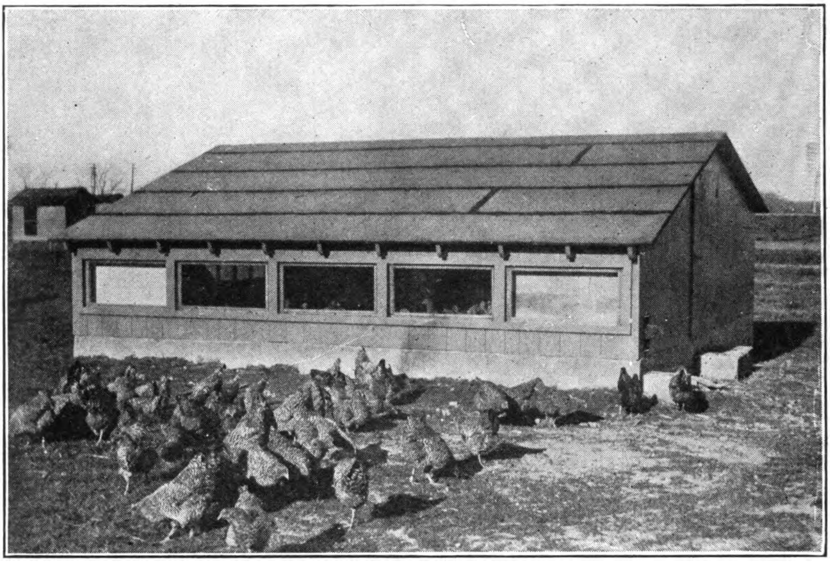
The plans of the house furnished by Prof. Jull, of MacDonald, should be well adapted to any Northern climate of the U. S. His full description of these houses and the accompanying plans should enable you to duplicate these houses if they suit your conditions.

The curtain fronts afford a fine opportunity for the control of the temperature. No doubt in many sections of our country there would be no necessity of closing the three openings in the center of the building.

PROF. JULL'S DESCRIPTION OF THE TOLMAN HOUSE

As Used at MacDonald College, Quebec, Canada

"This house is 20 feet long by 20 feet wide, 2½ feet high in front, 2½ feet high behind and 7 feet to the peak of the roof, the peak coming in the center of the house. A door 3½ feet wide by 6 feet high is in the Eeast end and a window 5 feet 4 inches wide by 4 feet 2 inches high is in the West end. The window is hinged at the top so that it can be raised in warm weather. The front of this house is covered with wire netting and is divided into five sections, each section being supplied with a separate curtain. Owing to the extreme cold weather which we have we are compelled to use the cotton curtain for a portion of the winter. The advantage of having five separate curtains in front in preference to one long one is that more satisfactory conditions can be maintained inside the house. The two ends and the back of the house are double boarded. The bottom boarding runs lengthwise, while the double boarding is tongue and grooved running up and down. It has a cement foundation and cement floor. It will accommodate 100 laying hens. This is one of the most economical houses which can be constructed. Farmers in the Province of Quebec are able to construct this house for about $115.00. Material costs approximately $75.00 and labor costs approximately $40.00."



· **Fig. 11.—Tolman Style House as used at Macdonald College**

PROF. JULL'S DESCRIPTION OF THE MACDONALD HOUSE

As Used at MacDonald College, Que., Can.

"This house is 20 feet long by 20 feet wide, 5 feet 6 inches high in front and 3 feet 6 inches behind, and 8 feet to the peak of the roof. A door 3½ feet wide by 6 feet high is in the East end and a window 5 feet 4 inches by 4 feet 2 inches high is in the West end. The window is hinged at the top so that it can be raised to give ventilation in warm weather. There are two windows each 4 feet by 3 feet in front with a curtain window 6 feet long by 3 feet high in between. The curtain window is covered with 2-inch wire mesh and in cold weather the cotton curtain is dropped. The house

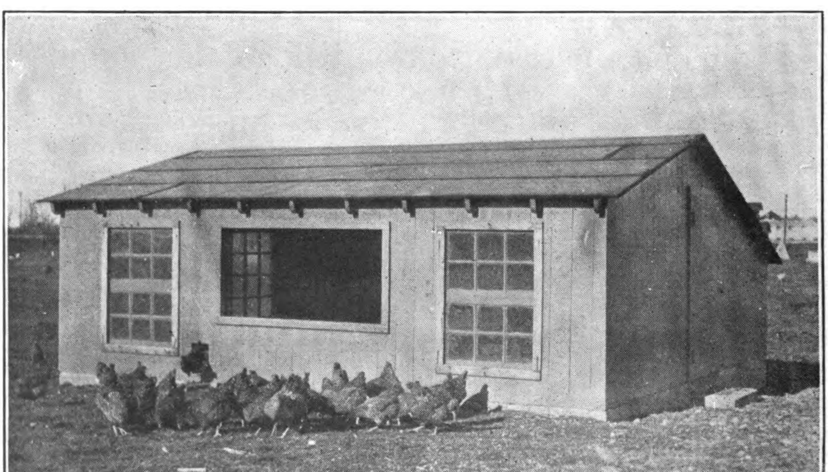


Fig. 12.—Mcdonald House.

is set upon cement foundation and has a cement floor. This is one of the most satisfactory houses used on our College plant. It gives practically the same results as the Tolman house, but provides more light. I believe, however, that the curtain window should not be quite so large, considering our severe climatic conditions during the winter season. If it were 4 feet long by about 2 feet high, or if it were provided with a permanent shutter which would keep the rain and snow out and at the same time break the draughts, I believe it would give still better satisfaction. The house will accommodate 100 birds. It may be constructed by farmers at a cost of approximately $150.00. The material costs approximately $100.00 and labor costs about $50.00."

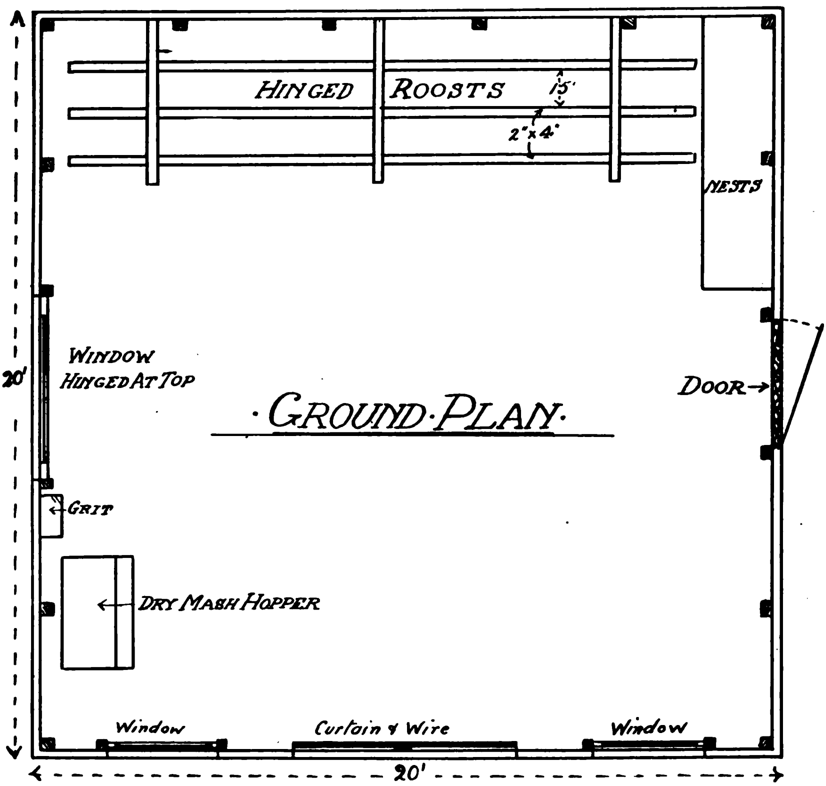


Fig. 12C

THE ELLIS HOUSE

The beauty and expensiveness of a house does not concern the hens. It is the comfort and healthfulness of the house that affects the hens. A very good type of house that is used considerably in the East is that known as the Ellis house. Prof. Stoneburn of the Matos Company, described this house in the Philadelphia North American, as follows:

"There exists among practical poultry growers an honest difference of opinion as to the relative merits of the so-called long house which shelters several hundred birds in one flock or divided into several flocks, and the small single pen or colony house. The plan under discussion will not appeal to those who advocate the use of buildings of large capacity. Its essential points cannot be incorporated in a long building. But those who require but a single building of relatively small capacity

or prefer to divide their birds into comparatively moderate-sized families will find much merit in the Ellis plan.

"The standard dimensions are as follows:

Length, 14 feet.
Width, 14 feet.
Height to ridge, 7 feet.
Height side walls, 4½ feet.

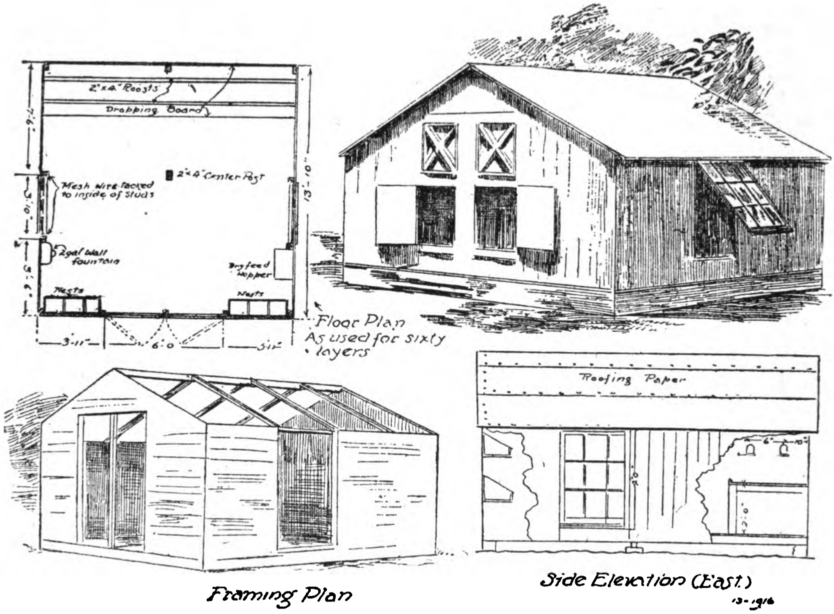


Fig. 61.—Plans for the Ellis Type of House

"The roof is even span, or A-shaped, sloping to the sides.

Building materials:

Frame, 2x4 inch.

"Sides, roof and floor, tongue-and-groove North Carolina pine boards, 6 inches wide.

Roof covered with a two-ply prepared roofing, brought down under eaves to make a tight joint.

"Doors and windows:

"Two doors are placed in the front—south end—of the building. Each door is three feet wide. These doors are simply substantial frames, covered with wire nettings, divided into two panels by cross strips.

"Each of the four panels is fitted with a cloth-covered frame hinged at the side and opening outward. This permits the attendant to regulate ventilation without entering the house, and also prevents the heavy accumulation of dust which is always to be noted on curtains which are swung up inside the house in the usual manner.

"A window is placed in each side wall, 3½ feet back from the front corner. Each sash is 3 feet wide and 4 feet high, hinged at the top to swing outward. Under this arrangement it is possible to provide thorough cross-ventilation without premitting rain to beat in on the floor.

"The window openings are protected with wire netting, stapled to the inside of the studs which form the window frames.

"The small hen doors may be cut at any place in the wall to give access to yards, when the latter are used. As a rule, these should be well toward

the front of the building to prevent draughts, which are objectionable during many months of the year.

"Furnishings:

"The nests are attached to the front wall on either side of the front doors. By placing these in tiers, one above the other, a sufficient number of nests may be provided in this convenient place to accommodate as many birds as may be quartered in the house.

"The dry-feed hopper is hung on one side wall, just adjoining the window, and the shelf or the water receptacle occupies a similar position on the opposite wall.

"The droppings board, three feet wide, extends entirely across the house next to the rear wall. This is placed two feet above the floor.

"Two roosts, made of 2x4-inch pieces, are placed about this platform. The rear roost should be at least ten inches from the wall and the other about eighteen inches further toward the front.

"A single 2x4-inch stud extending from floor to ridge supports the roof. This is placed about midway from front to back of the building.

Earth or Board Floors

"The floor may be made of earth, filled in several inches above the ground level, or of boards. Mr. Ellis strongly recommends the latter, not only as a protection against enemies, but for sanitary reasons as well.

"Adaptability—This house can be put to many uses. Equipped with a coal-burning colony brooder to care for a large flock of chicks, or divided by low partitions into six pens with small lamp-heated hovers, it makes a fine brooder house.

"At weaning time the brooders may be removed and the chicks permitted to remain in their accustomed home until maturity.

"As a laying house it will accommodate upward of fifty mature birds. In short, it can be used to advantage twelve months in the year."

A SPLENDID HOUSE FOR COLD CLIMATES

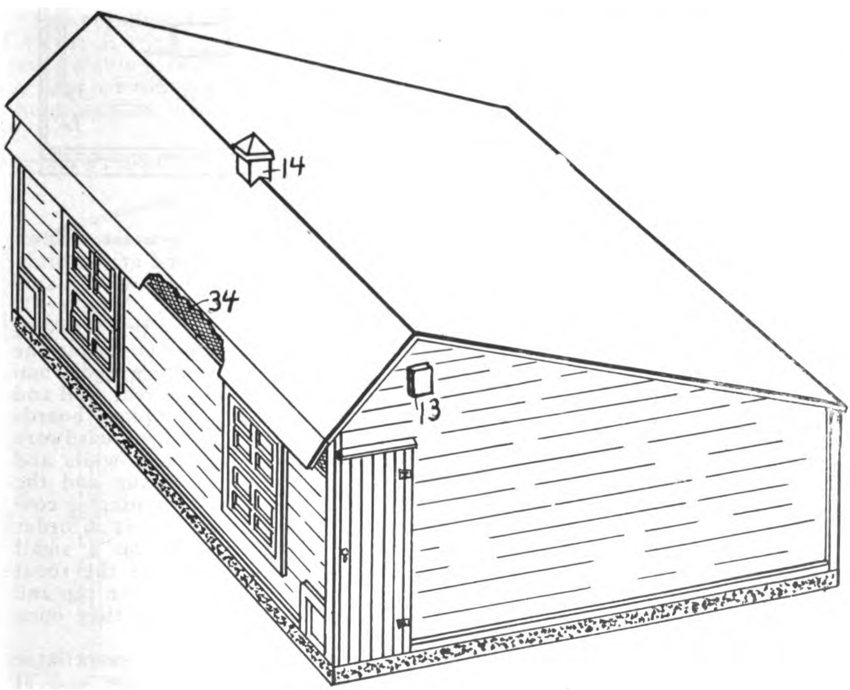


Fig. 1.—Exterior View.

Figure 1 represents a house designed by Mr. W. C. Clare, of Oswego New York. Mr. Clare is a student of this School and has worked some very valuable ideas into a house that is especially suitable for cold climates. We would suggest placing a gutter on the roof, which slopes to the front of the house, so as to prevent the rain from dropping onto the chickens in front and to prevent same from flowing into the house. These houses, as he recommends them, are built 14 feet square, but they might be built 12, 14, 16 or 20 feet square and work just as well. Number 14 is the ventilating cap at top of the roof. Number 13 shows the ventilating holes in the ends of the house. These holes are covered over with a tin covering so as to prevent the rain from beating into same. Number 34 shows the ventilator beneath the eaves and is covered with poultry netting. This can be raised or lowered as occasion demands.

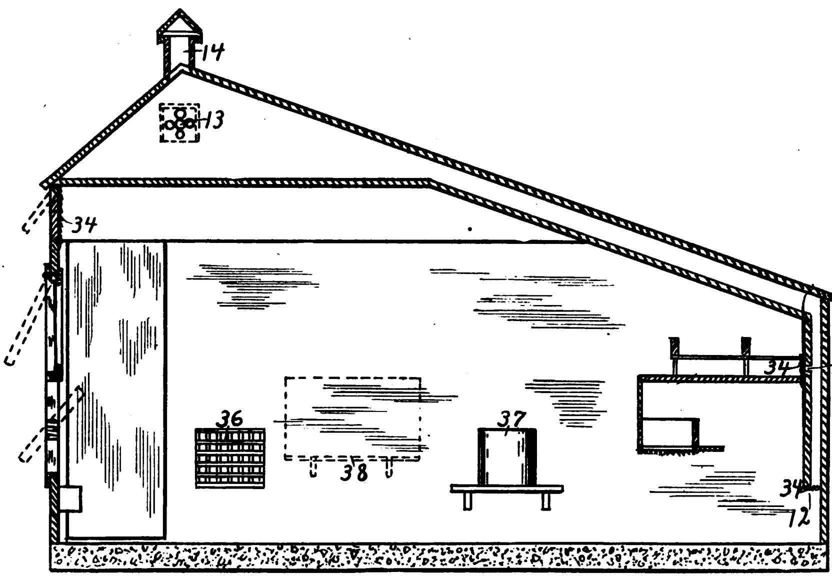


Fig. 2.—Cross Section Cold Weather House.

Figure 2 shows an end view or cross section of this same house. Numbers 13 and 14 show the ventilators at the end of the house and at the highest part of the roof. Number 36 is a wire basket attached to the side wall and vegetables and green feed are placed in this basket. Number 38 shows where the dry mash hopper is placed. Number 37 is the drinking fountain. You will note the nests under the dropping boards facing the rear wall. There is a door in front of the nests that can be lowered when the eggs are being gathered. The roost poles are hinged to the rear wall and can be raised and fastened to the ceiling above when the droppings boards are being cleared. Number 12 shows an opening covered with hardware cloth and this opening passes up between the inner and outer walls and the air circulates on up through the space between the ceiling and the roof and on out the ventilator caps in the roof. The entire ceiling is covered with six inch flooring boards or ceiling boards of some sort in order to make the house warmer in winter months. There is also a small opening between the droppings board and the ceiling back of the roost poles. You will note that the top window sash are hinged at the top and open outward and the lower window sash are fastened so that they open back through the house and fasten at the top.

In the winter months, Mr. Clare recommends closing the ventilator in the front and he also recommends closing the upper window sash at night. All of these can be left open in summer months. The air shafts

in the rear of the house, back of the nest and roost poles, starts within 12 inches of the floor. The house may be divided with a partition so as to make two pens. The rear of the house is 5 feet to the eaves and is 8 feet high in front. I believe this house will give excellent satisfaction in any climate which is more or less cold during the winter months. This house is patented by Mr. Clare and detail plans and blue prints of it can be obtained by writing direct to him.

LAMBERT'S POULTRY HOUSE

A house for 100 hens, which is used a great deal in some sections of the East, is one designed by Prof. Lambert, of Rhode Island. He has this to say concerning his house:

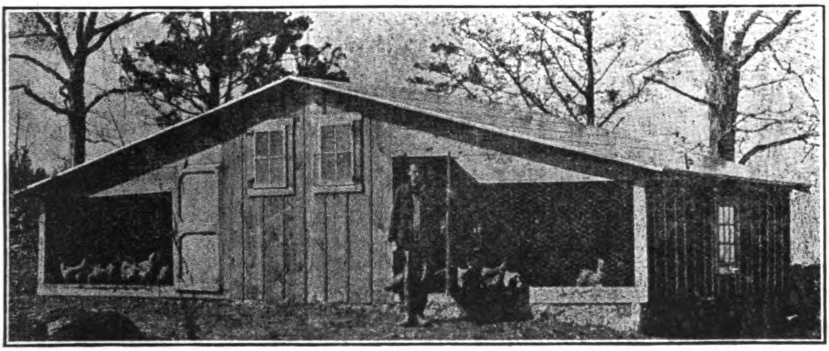


Fig. 62.—The Lambert House.

"The building is 28 feet front and 14 feet deep; 8 feet high at the center and 4 feet at the eaves. A partition runs through the center from front to rear, making two rooms, each 14x14 feet. Two feet above the sills along the partitions are the dropping boards, 4 feet wide. Over these, at the height of six inches, are the roosting poles of 2x3 spruce, each 14 feet long.

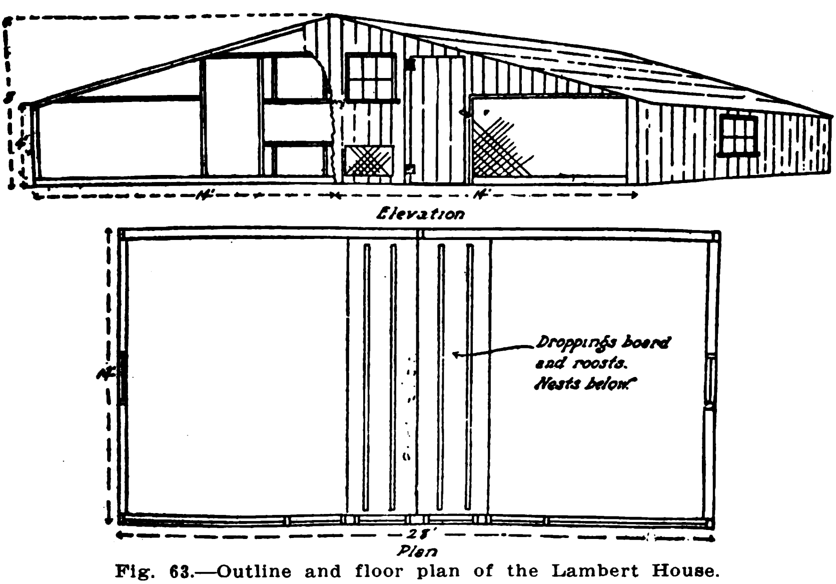


Fig. 63.—Outline and floor plan of the Lambert House.

"The opening in front, as shown in exterior view, is 7½x4 feet tnd is covered with p-inch mesh wire netting. This can be closed at night, when necessary, and on story days, with a muslin covered frame on hinges which swings open against the side of the building. There are small windows in front of the roosting rooms, and one each on the east and west sides of the house. The entrance doors are 4 feet from the center and are about 5x2½ feet. The nest boxes can be placed under the droppings boards or along the rear or side of the house, back of the windows.

"The sills are 4x4, and the studding 2x4 and 2x3. The center partition should be absolutely air tight, so that there can be no draft between the apartments. The roof should be covered with the three-ply tarred felting or Paroid Roofing Paper and the rear and sides with same of a lighter weight. The roof and the sides should be painted with roofing paint once during the year.

"The earth should be taken out to a depth of six inches below the sill once each year and filled in again with dry sand. Over this sand is kept a heavy litter of dry leaves. The building is thoroughly cleaned and white-washed once a year. When we keep birds in it during the summer, it is white-washed in the spring and again in the fall. We are intending to build some houses for breeding purposes on this plan, one-half the floor space, these to accommodate ten to twenty breeders on one side while the other side can be used for sitters and spare birds. This has been in use at least sixteen years. My neighbor built several fifteen years ago. His profit per hen has never fallen below $2.30 per bird. The curtains are easily closed over the 7½x4 feet opening—in fact, we have no curtains on our house here and have kept Leghorns in it all winter."

NEW JERSEY HOUSE

Fig. 24. The following is a description of the New Jersey multiple unit house. The plan is such that units can be added at any time. The following description is by Prof. Lewis, of the New Jersey Experiment Station:

"The outside dimensions are 40x20 feet, sills to be 4x6, and are to be bolted to a concrete foundation wall eight inches wide and twenty inches deep, which is laid on tamped cinders or crushed stone, the entire depth of the foundation trench being three feet.

"The shed roof type of construction is used with nine foot studding in front and four and one-half foot studding in the back. All studding and rafters are 2x4 hemlock or yellow pine. A 2x6 girder runs the length of the building supporting the rafters, and itself being supported every ten feet by 4x4 posts, resting on concrete piers. The plates should be made of 2x4 material doubled and joints broken.

"All outside walls and roofs to be single boarded, preferably of eight or six-inch tongued and grooved yellow pine; white pine can be used, but is more expensive. The roof and back wall should be covered with a good roofing paper, all joints should be carefully lapped and cemented.

"The muslin curtains in the front wall are hinged at the top and can be lifted up. The 3x5 glass sash are hinged at the side and open as indicated on the floor plan. One window in each pen should be so constructed that part of the wall will open when desired thus making a combination door and window. This will greatly facilitate cleaning and filling hoppers in an extremely long house.

"The droppings boards, perches and nests are best arranged on the back wall, the perches being hinged to the wall so that they may be hooked up when cleaning, the nests being darkened by a hinged door in front which may be let down when it is desired to remove the eggs.

"The dividing partition between the units is built of boards and extends from the back wall to within six feet of the front wall; the remaining space is left entirely open. This protects the birds from any drafts when on the roosts. When desired, portable, light wire partitions may be used to separate the units. A large dry mash hopper can be built into this middle partition. If four or more units are built, it is only necessary to have a hopper in the center of every other unit, the other dividing

partition being utilized for nesting space. There is an elevated platform under the muslin front which provides room for the water fountain and grit and shell hoppers.

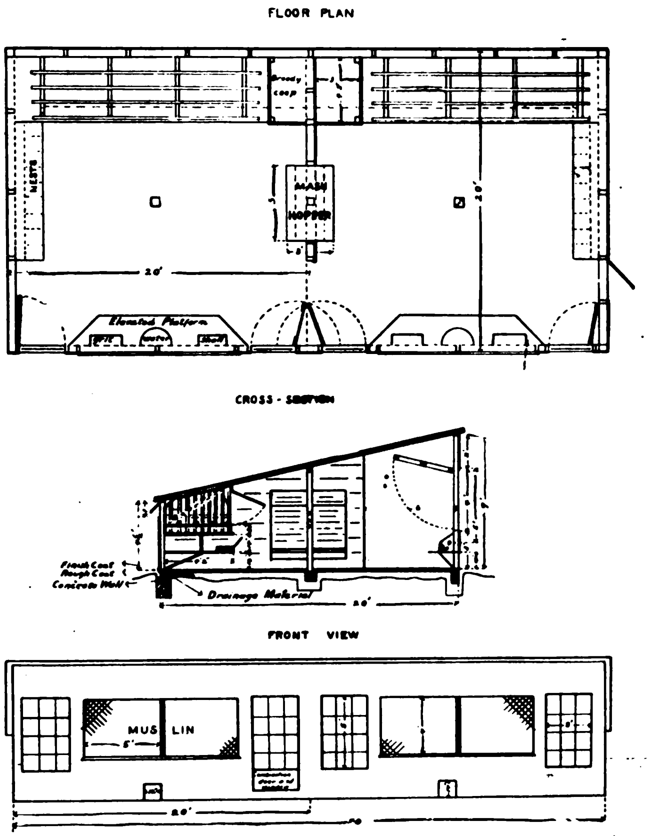


Fig. 24.—New Jersey House.

"When the house is completed a concrete floor should be laid, and should consist of three distinct layers. First, a layer of about six to ten inches of cinders or coarse gravel, tamped thoroughly to serve for drainage purposes to keep the soil moisture away from the bottom of the floor. Next a rough coat of concrete about four inches thick, and over this a finished coat of two parts of sand to one of cement, troweled smooth and rounded at the corners. Where there is danger of much moisture coming up from below it is advisable to put a layer of tarred building paper between the rough and finished coats of cement. It should be nailed down with the flat headed nails, and the heads of the latter should be left sticking out about one-quarter of an inch to hold the top coat.

"Such a floor is moisture-proof, rat-proof, vermin-proof and easily and quickly cleaned.

"Total cost of this house, not including labor, if concrete floor is put in the house and cinders and sand have to be purchased, is $177.89.

"This gives a cost per square foot of floor space of $0.222; a cost per running foot of house of $4.44; a cost per bird, allowing 4 square feet per bird, of $0.888. Adding labor to this at one-fourth the cost of material, the total cost of $222.36, or $1.11 per bird."

THE "LAYWELL" HOUSE

The Modern "Laywell" House is a house designed for large flocks of laying hens. It is designed with a view to economy of both material in building and of labor in carying for the flock. It is patterned largely after the R. C. Lawry Hendwell, used on the Yesterlaid Egg Farms. One man can feed and water the fowls, gather the eggs, clean the houses and still have spare time for other work, and we do not know of any other system of housing by which this is possible, unless it is in a large Fool Proof House built on the two-story plan.

These houses can be built 20x40 feet for 500 Leghorns, 24x48 feet for 750 Leghorns, and 30x60 feet for 1,000 Leghorns. They will not accommodate quite so many of the larger breeds. The house is divided in the middle, and half of the block kept on each side. The house is two stories, the lower rooms being used in which to feed and lay, and the upper room being used as a roosting room. The ceiling of the upper room should be ceiled, and the upper story should be covered with roofing or building paper, as this adds to the warmth of the roosting quarters. The house is built of matched siding or battens. The lower story is seven feet high and the upper story is six feet.

The windows in the lower story should be arranged so they can be raised and lowered. The windows admit an abundance of sunlight and can be lowered or raised to admit ventilation. If the wind is from the east or from the southwest, we close all windows on that side of the house and leave the windows on the opposite side open. By this system we always have plenty of fresh air, and also avoid a wind or draft on the fowls. You will notice that the windows are on all sides of the house. The windows in the upper story consist of a single sash and are arranged so as to slide back and forth. Some of the windows should always be open at least part way in even the most severe weather, unless the temperature should drop to one or more below zero. The exit for the fowls should be through the windows. It is advisable to have two large yards or ranges in connection with each house. While the yard on one side is being cultivated the fowls can use the other yard.

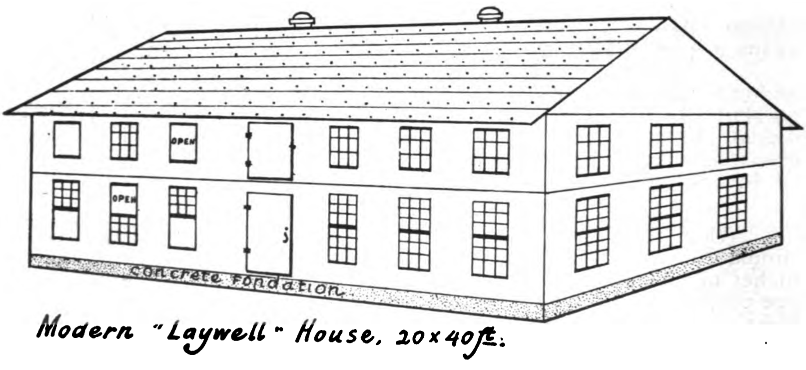


Fig. 14.—Laywell House.

There are only two outside doors to the building. The lower one being used by the attendant and the upper one is used for storing feed in the two large bins. The dry mash hopper and the mixed grain bin each hold sufficient feed to last the flock for at least a month. The feed is mixed in the feed room and then hauled to the "Laywell" and the bins and self-feeding hopper are each filled. The dry mash feeds continually into the hopper below, and all the attendant has to do each time he feeds is to open the chute below and take out sufficient grain to feed the stock. The water is piped to the building, and about all the attendant needs to do is to see that the building is kept clean, gather the eggs, and look after the health and comfort of the fowls. The droppings can be easily

cleaned from the roosting room by means of a steel brush or broom, and brushed from the upper door into a chute and run directly into the farm wagon and hauled out to fertilize the fields which are being cultivated. The roof is covered with sheeting and composition roofing.

The foundation is of concrete and the floor should be of the same. The nests are arranged about the wall, and it is best to have a slanting cover over the top to prevent the hens from roosting on them. Make them. Make the entrance from the end or back so the nests will be reasonably dark.

Steps should be built near the back of each room, and preferably to one side, so that the attendant may easily ascend them, and the birds use them in going up to roost. It is well to make the steps of light material and hinge them at the top so they can be pulled up out of the way during the day and the attendant can let them down when the last afternoon feed is given. They can be balanced with a weight much the same as a window sash.

Nearly the entire upper floor may be covered with roosts. A passageway should be left entirely around the outside of the roost poles. It may also be necessary to place a six-inch board around the room, just about six inches wider than the roosts, so that the droppings and feathers can be confined.

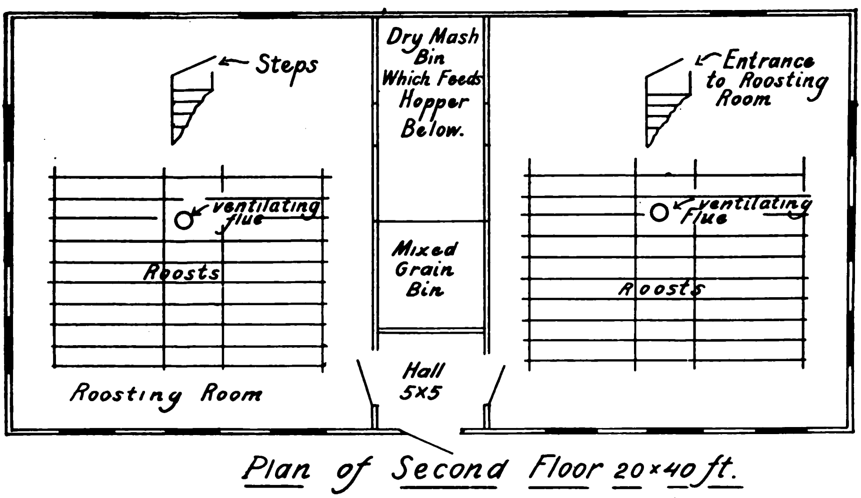


Fig. 64.—Modern Laywell House.

Many large poultry farms have failed in the past because the amount of labor required to care for the birds in the ol dstyle long houses robbed the farm of all its profits. This house has certainly solved this problem, and we most heartily recommend its adoption by all who expect to establish large commercial egg farms. The details and interior of the house can be arranged to suit you, and perhaps improved upon, but the system and general idea should not be departed from. This house is intended only for use where fowls are kept in large numbers and where they have plenty of range.

You must build such a house only on dry sandy soil, or on soil that is well drained, or you might be troubled with soil contamination.

Use only one sash and place the windows in the upper story even with the level of the floor and not so high as shown in the drawing. The roost poles should be above the level of the top of the windows. Ventilate near the floor of the roosting room, and arrange the windows so they will slide back and forth.

THE HENDWELL
Or a House of 1,000 Laying Hens

The 1,000 unit house called the Hendwell represents a radical departure in poultry house construction, but it combines many ideas that are worthy of consideration by those contemplating handling poultry on a large scale.

The Hendwells are 30 feet wide by 60 feet long, and so built and located that one man can very easily care for five of them. They are provided with cement floors and foundations and divided into two rooms,

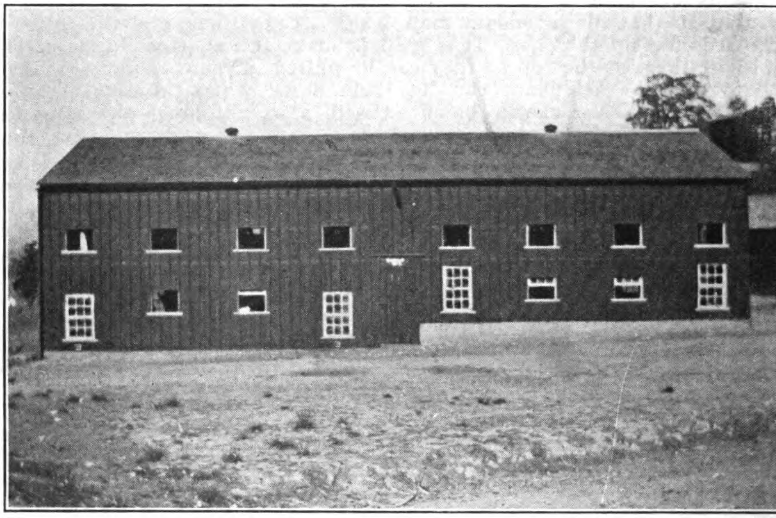


Fig. 65.—Outside view of the Hendwell as used on the Yesterlaid Egg Farms at Pacific, Mo.

each 30 feet square. Each of these Hendwells is a complete poultry plant in itself. The attendant has to go through only two doors to do the work required in the care of a thousand hens.

The common objection, says Mr. Lawry, raised to the long continuous house with the light coming from one direction only, is that the hen working with her head toward the light, constantly scratches the litter towards the back of the house where it becomes piled up to such an extent that it must be raked to the front of the house each day in order to keep the floor evenly covered. In the Hendwell, this objction is entirely obviated and it has never been found necessary to stir the litter in any way or to even it up in depth by moving it from one part of the room to another. The light is so uniform that the hens can work equally well in any part of the house or when facing any direction.

It is the opinion of Mr. Lawry that the cost of one of these buildings should not exceed $1,150 in any locality and might very easily be kept as low as $850. (It will cost 40 per cent more at present prices of material.)

In these houses there are constant currents of air near the floor of the roosting rooms. The perches rest on wooden horses which place the fowls above the window openings.

There is a folding stairway which is let down in the early part of the morning to permit the hens to begin scratching in the litter as soon as they leave their roosts. It is difficult to find a house that has more labor saving devices than a Hendwell.

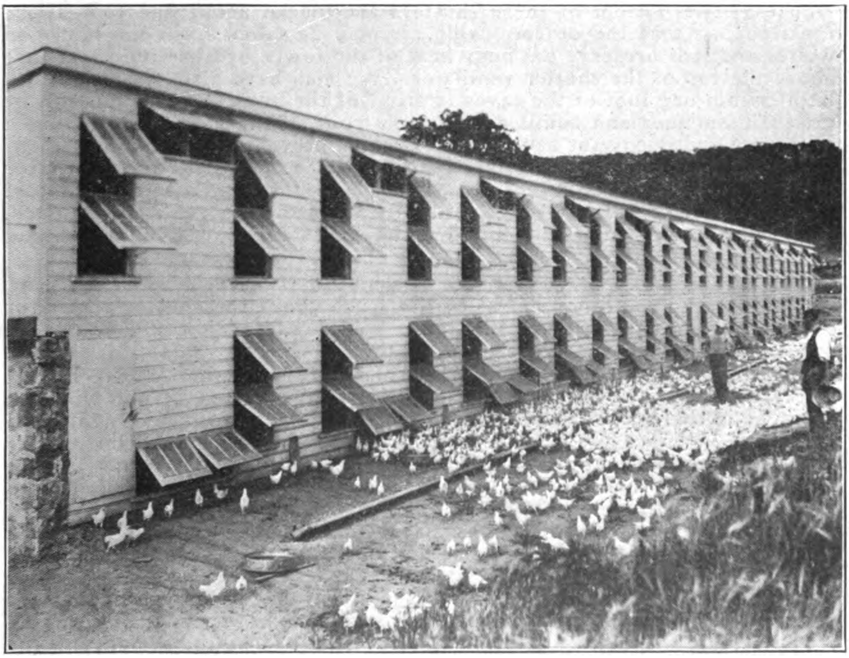
If you launch at once into the poultry business with the money to make an immediate purchase of your stock, or if you can arrange to rear

enough pullets for one of these houses, we believe that you would find this method of housing satisfactory.

An objection that can be urged against the Hendwell is that it does not allow one to grow gradually into the work and add units by unit as as the flock increases. The unit of a thousand is large and it takes a beginner some time to reach this number if the stock must be raised, or a big outlay, if the fowls are to be purchased.

Another thing to consider is that you cannot carry, with success, a thousand hens in a flock in all sections of the country. It takes mighty good drainage to run so many together. Unless there is good drainage, or if the soil is heavy, there is danger of the ground becoming poisoned which will get the flock into trouble.

U. S. "FARM COLONY" HOUSE



The above illustrates one of the many large poultry houses of the type used on the Farm Colony of the United States Disciplinary Barracks at Fort Leavenworth, Kansas. These houses are built two stories; the lower portion is filled with brooder stoves in spring and five to six thousand baby chicks are brooded in each one of these houses. The houses are 20 feet and 225 feet long. These young chicks are kept in these houses until they are fully matured. When they are old enough to do without heat, the stoves are removed and temporary roosting poles are put in the lower section There is an opening in the floor near the front in every section in the house and there is a board runway up to this opening which leads from the first floor to the second. The second story contains the nests, roosting quarters, etc. Nests are also placed in the lower section and this isused as additional scratch room. After the cockerels mature, they are culled out and sold for broilers or separated for breeding purposes. The pullets are left in the house and kept there until they are two years old or sold on the market. All the windows are hinged at the top and open outward. The greatest objection which has been found with this house is the im-

mense amount of glass in front. There is also one window sash in each section in the rear of each story to admit light toward the back. By using muslin or burlap instead of glass in about one-half of the window space, this house gives very good satisfaction for large flocks.

THE IMPROVED FOOL PROOF POULTRY HOUSE

The accompanying illustrations, Figures Nos. 19 and 20, show the latest additions and improvements in the Fool Proof Poultry Houses. With these changes, the house is suitable to all climates, and the method of ventilation takes the carbon dioxide or the bad air away from the floor in winter months. We do not hesitate to recommend this to any and all poultrymen as one of the best designs for a poultry house that has yet been made public. In fact, it is so nearly perfect, that it can scarcely be improved upon.

The same shutter ventilators are used that are used in the Fool Proof Houses. The bottom of these shutters are placed about one foot above the floor, so that the objectionable air may be taken from the house in winter and still preserve the body heat of the fowls, because the roosts are above the top of the shutter ventilator. We also have a twelve-inch ventilator within one foot of the eaves in front of the house, so that this can be raised in summer and admit air near the roof. This ventilator is hinged at the top and opens out at the botton, which prevents the rain from blowing in. The triangular boards are hinged at each end of the top ventilator so that when the ventilator is closed in winter the boards at the end fold back out of the way. They are used only when the top ventilator is open. They act as a prop and, also, prevent the rain from blowing in at the end of the top ventilator. They are held in place with hooks and eyes.

In an extreme southern climate or where it is warm most of the year, the poultryman could have most of the space above the shutter ventilator covered with a curtain or cloth shutter on hinges and it could be opened outward in summer and closed in winter.

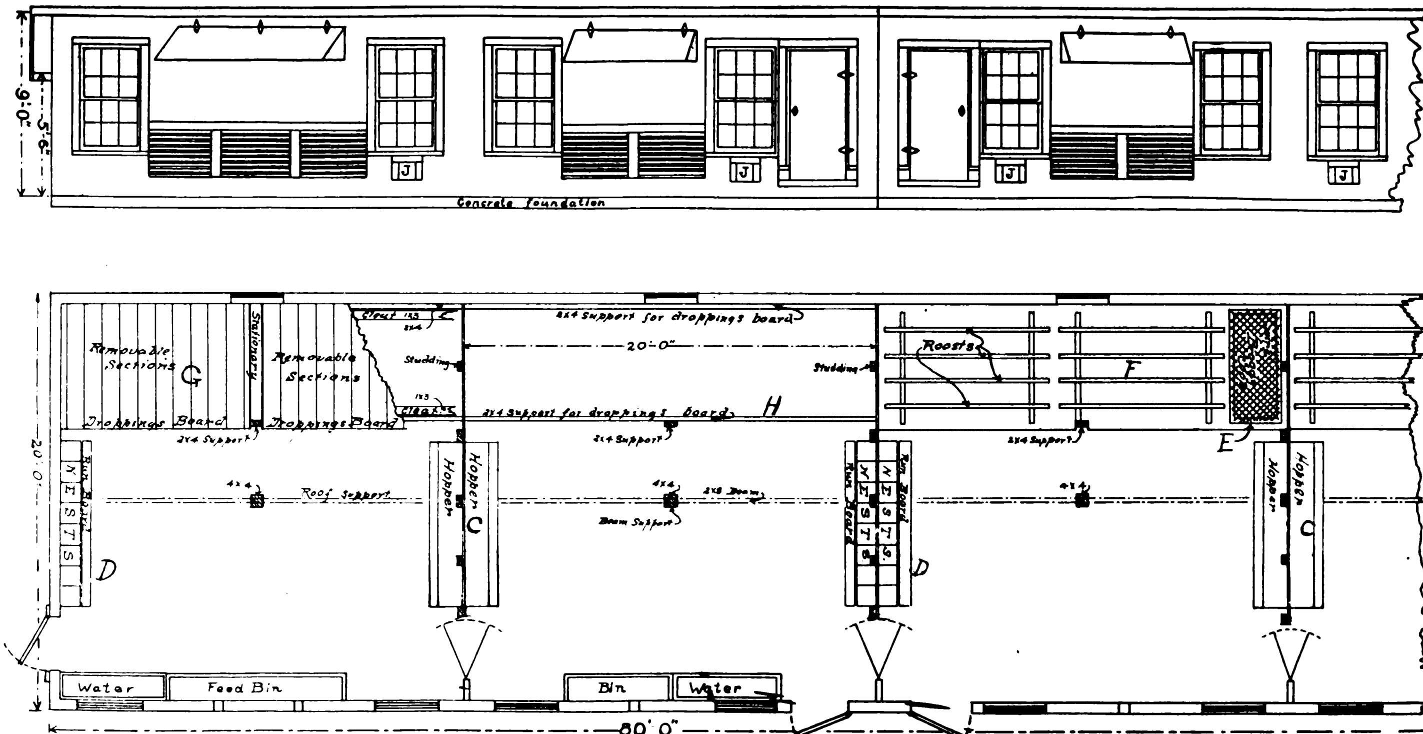
Each window sash is independent of the other sash. All are hinged at the top and open outward at the bottom. We prefer all our windows arranged in that way so that the birds may have the advantage of additional venilation at times when needed, and at the same time the litter and he fowls and the house are protected from blowing rains and storms. There is a window sill dividing each sash, and the lower window sash is hinged to the underneath side of this sill. The top sash is hinged to the window frame at the top. When each sash is opened at the bottom, it is held in place by a heavy wire which is twisted at one end to make an eye. Through this a staple is driven and the wire is held to the window frame. The other end of the wire is bent at a right angle so that it forms a hook. Another staple is driven into the under side, which is the inner side of the window sash. The wire is hooked into that. Then the weight of the window rests on this heavy wire and there is no danger of the window blowing off the hinges or getting broken.

All exits and hen doors should be at least eight inches from the floor to keep the litter from being scratched out and wasted.

The rear of these houses are the same as the Fool Proof Houses and the rear ventilators and windows are the same.

In the long laying house, 20 by 80 feet, figure 20, there are two doors near the center. If you do not use a double yarding system, only one door would be necessary. These are added for convenience in gathering eggs, cleaning and disinfecting the house, and for carrying in feed, and there is also an outside door in each end on the house. The center doors in front are only used in the long laying houses.

The floor plan and interior of the house is practically the same as in the Fool Proof Houses. This can be arranged to meet the individual needs of each poultryman. We use and recommend large hoppers for the dry mash and bins for the grain feed. These will save carrying out small lots at a time. You will see that we also recommend swinging partition doors, even in the long laying houses. These permit the attendant to pass from



Figs. 19, 20.—Front and Ground Plan of Improved Fool Proof House.

pen to pen without having to stop to unhook doors, but at the same time they prevent a draft, and also, enable one man to close the exits and catch any fowl which he sees out of condition, or to catch a bird for any other reason. He could not do this so well if there were no doors. There is a passageway for the fowls between each door and the front wall. There is a foot space at that point with a small door that slides up and down. These doors are always kept open in the laying houses, except when the attendant wishes to divide the birds into four pens or desires to catch

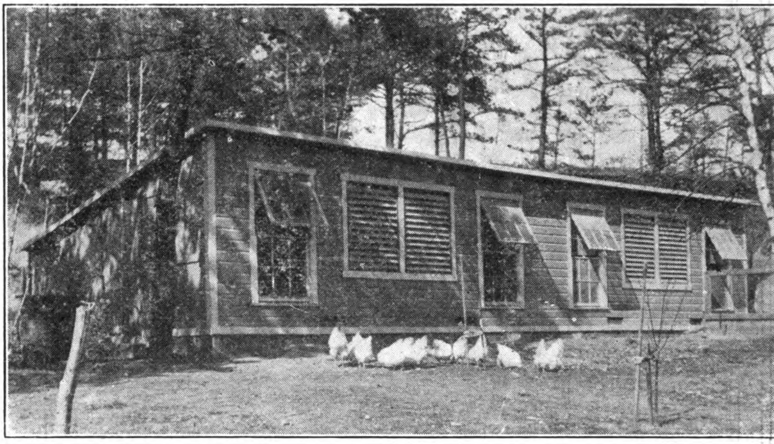


Fig. 68.—A Fool Proof Poultry House built by one of the Students of the American School of Poultry Husbandry. The ends and rear of house are covered with plaster board. The house is built in sections and bolted together so that it may be moved from place to place. The house was built on rented land and can be easily taken apart and moved.

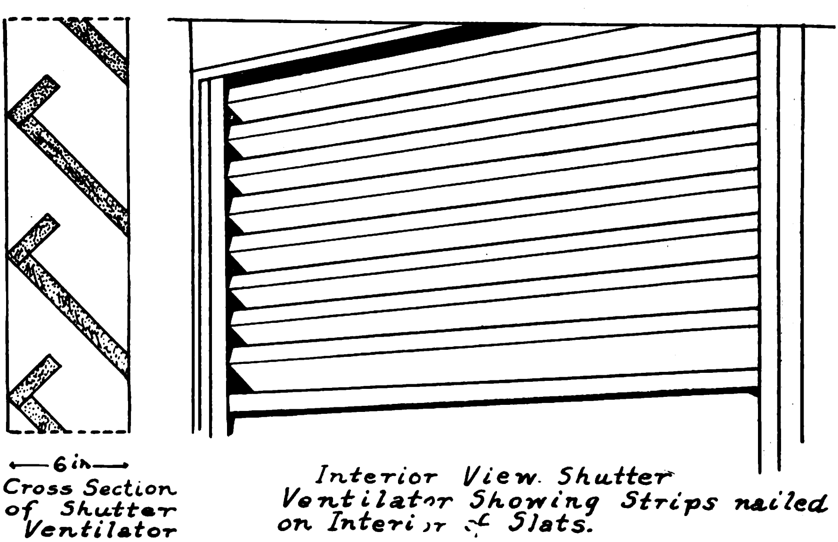


Fig. 21.—Cross section and interior of shutter ventilator.

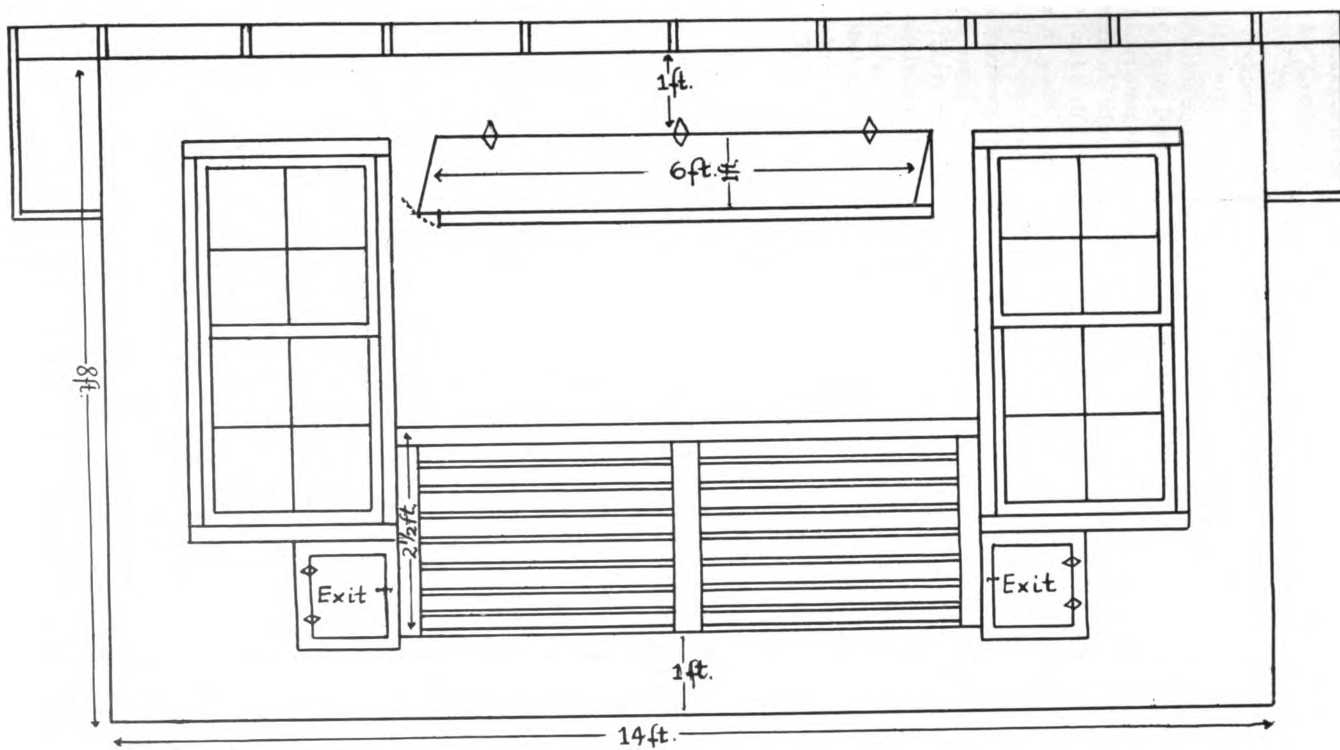


Fig. 72.—Front view of 14-foot section of Improved Fool Proof House.

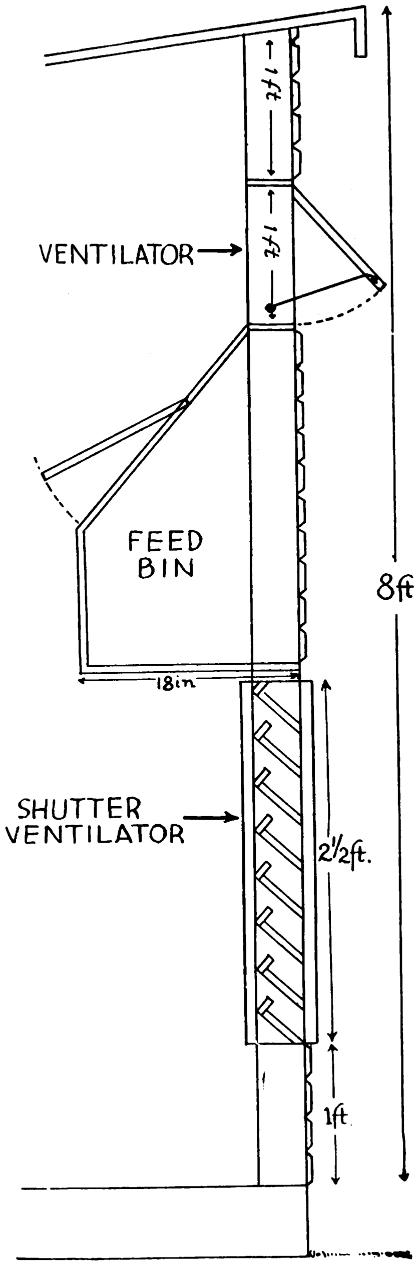


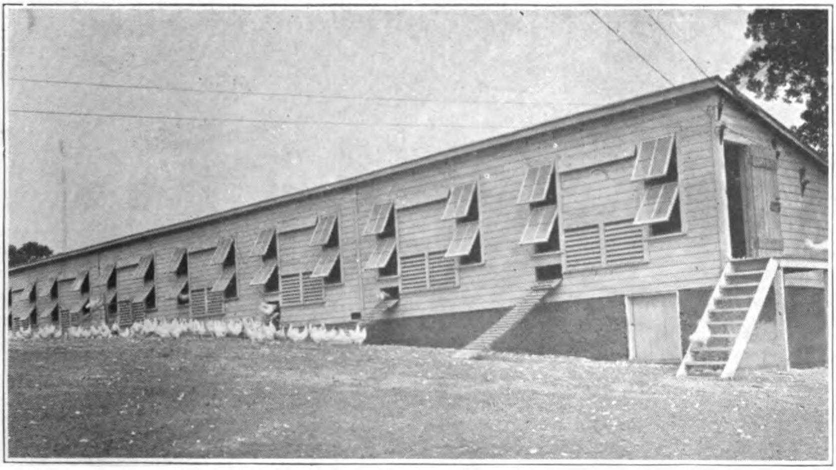
Fig. 73.—Cross section showing dimensions and arrangement of front of Improved Fool Proof House.

a bird for any reason. When these are open every hen in the house can have accss to the entire house, from one end to the other. These small passageways are only closed when desired.

The partitions in this house may be made of cloth, heavy domestic or canvas. The studs can be put in and, instead of using lumber, you can often cheapen a house by using cloth and coating it with "Tector," sold by the Pittsburg Plate Glass Co.

We think you should use a concrete foundation, just as is recommended in the Fool Proof Houses. If you prefer a board floor to concrete, we would recommend putting in iron ventilators in the sides and ends of the foundation, which will admit ventilation under the floor and, at the same time, make the floor rat proof. You can lay a double floor if you want it extra good and dry, but in most climates a single floor answers very well. A dirt floor might be used inside of the concrete foundation in some sections, but we prefer either a board floor constructed as stated above, using a concrete foundation, or else a good concrete floor. Concrete floors must be built in the spring or summer to give them time to become thoroughly seasoned and dried out before winter. Also, provide for plenty of underdrainage, or put a string of tiling every four or six feet just underneath the floor and let it extend from one side of the foundation to the other. The air in passing through will keep the floor perfectly dry.

The space between each slat in the ventilator is about an inch and a half. On the interior of each slat of the ventilator is nailed a little strip about the thickness of a lath. The edge of this strip extends about a half inch or more above the edge of the ventilator. This forces the current of air upward as the air passes through the ventilator. This prevents a direct draft on the fowls. This leaves a space of about an inch



This illustrates one of the long Fool Proof Poultry Houses used on the American Poultry School's farm. This particular house is 14 feet deep and is divided into sections 14 feet square. This house shows the windows, ventilators, and all in operation with a portion of the flock in front. This house is fully described in this lesson and in lessons 1 and 2.

or less between the top of the strip and the next slat in the ventilator. As ventilators should be placed closer together, and in extreme northern climates a cloth or burlap may be tacked over the interior of the ventilator in winter and removed in summer. By using a little common sense and making slight changes to meet the needs of the climate, this system you go furher north and in climates where the wind blows consantly, the of ventilation can be used in all locations with equal satisfaction. If our opinion is worth anything, this is one of the best, if not the best, method of ventilation used in any house in any climate. In warm climate these houses should be built more open and more cheaply constructed.

If these houses are built in sections 12x12 feet, or 14x14 feet, we recommend building them 8 feet high in front and 5½ feet in the rear. If you use them as a large laying house, sections 20x20 feet, they should be built about 9 feet in front and 5½ in the rear. In 8x12 feet colony houses, 7 feet is high enough for the front. You can change the height to fit your lumber and your needs. The important thing above everything else is the system of ventilation. It will tend to increase the egg yield and the good health of your flock, and will aid you in avoiding dampness, colds, roup and kindred diseases.

We call these Fool Proof Houses because the method of ventilation is practically fool proof. That is one of the most essential features of any house.

We recommend the Fool Proof Houses in preference to any we have ever used or seen used. You can build them in colony houses 8x12, or in units 10, 12, 14, 16 or 20 feet square, or the large house for one large flock can be built, 48x60 feet. All will give equal satisfaction.

TWO-STORY FOOL PROOF HOUSE

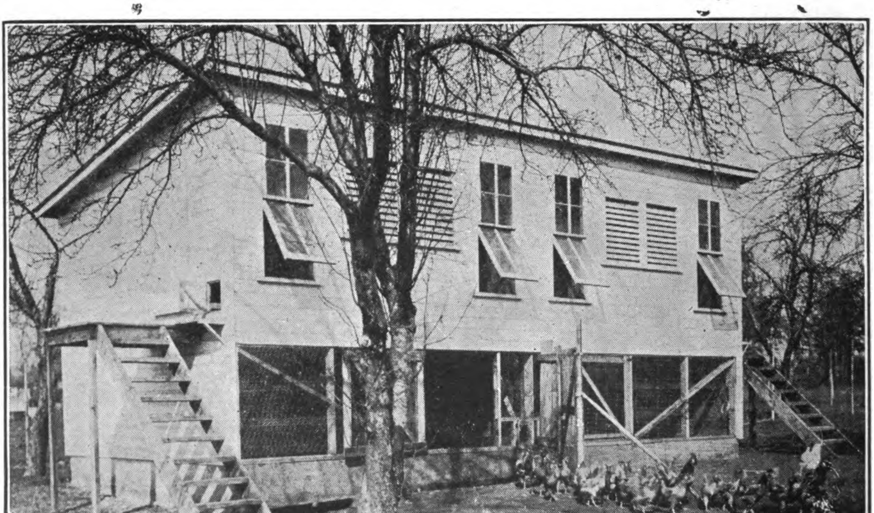


Fig. 66.—Two story Fool Proof House. The shutter ventilators should be lowered to within a foot of the floor. That is the only improvement we could suggest in the above plan to make it highly satisfactory in every detail.

It is possible to double the floor space and add at least 50 per cent more to its capacity without adding but very little to the original cost. By making the house a two-story building this can be easily and inexpensively done. Fig. 66 represents such a house.

We would recommend building a four-inch concrete wall for a foundation, just the same as in the other Fool Proof houses. A dirt floor may be used in the lower part. The soil in this should be removed and renewed about once or twice a year. The front of the lower portion should be covered with one-inch mesh poultry netting and a door built in each section to permit the attendant or birds to go in and out. The only extra cost in building the lower part of the house is the studding and siding boards.

The upper portion of the house should be built like the "Improved Fool Proof Type." The hens eat, lay and roost in the upper room. This has a board floor. The hens pass up and down on a runway on the inside of the lower section, and by way of the stairway on the outside. There should be a stairway built on each end of the house and there should be a runway coming up through the floor in the front of each section. The opening in the floor has a trap door that can be let down so as to close the same when necessary. This opening in the floor is made in one corner of the room near the front. It is surrounded by an eight or ten inch board so as to confine the straw or litter to the upper floor.

In bad winter weather, the hens can be confined to this house for long periods of time with no very bad results. They have a board floor above, covered with litter in which to exercise, and they have a floor below so they can get onto the soil. We recommend this house for use on city lots where hens must be confined throughout the year. You can buy pullets in the fall and put them in this house and keep them there and they will pay a handsome profit on the feed and the investment. You can put at least 33 1-3 to 50 per cent more hens in the two story than you can in the same house built as a one story. This idea can be used in either the 14, 16 or 20 feet sections and the house built as long as desired. The lower story should be built at least four or five feet high. It can be built high enough for you to walk erect beneath the floor but that is hardly thought necessary.

QUESTIONS FOR HOUSING LESSON NO. 4

1—How can the long house be arranged so as to use a portion of it for a good breeding pen for a few birds?

2—What method is used to keep the curtains in place in the Massachusetts house?

3—In a few words, what does Dr. LeGear give as the requisites of a poultry house?

4—What objections, if any, could you offer to the U. S. "Farm Colony" house?

5—What is the principal defect of the Dr. Woods' house and how can it be remedied to some extent?

6—What addition should be made to the Clare Cold Weather house? Why?

7—What advantage has the Macdonald type of house over the Tolman type?

8—Along what wall are the roosts and droppings boards placed in the Lambert house?

9—What kind of walls and roof are recommended for the New Jersey house?

10—Where are the nests, hoppers, drinking pans, grit and shell hoppers placed in the New Jersey house?

11—How many birds can one man take care of in the Laywell houses? Why?

12—How are the windows arranged in the Laywell house?

13—Describe the arrangements for feed and water in the Laywell house.

14—How can the Missouri House be made good for cold climates?

15—What is the estimated cost of a Hendwell for 1,000 laying hens?

16—In what way is the Improved Fool Proof House better than the ordinary type of Fool Proof House?

17—Describe the method of putting in partitions in the Improved Fool Proof House.

18—How are the windows hung in this house?

19—What can you say of the construction of the shutter ventilator?

20—What advantages has the two-story Improved Fool Proof House?

INDEX

INDEX—Continued

Poultry Equipment, Appliances and Accessories

By T. E. QUISENBERRY

The poultryman who pitches feed from the door of the residence or out of the corn crib as he feeds the stock has little need of appliances for the saving of labor. The man or woman who wishes to adopt the modern way of caring for the fowls needs to have conveniences to carry on the work.

There are many devices placed on the market by manufacturers for the saving of labor. Some of them are good and some are worthless. If you are handy with the saw and hammer, you can make most of the appliances you need and save this investment. The appliances that we recommend are for the most part little trouble to build and more or less inexpensive.

However, there is a limit to the number of appliances needed, and the man of mechanical turn will often spend much thought and time trying to improve on appliances and gives time to such work that could be so well used in working out the various poultry problems with which he is daily confronted. Do not spend a lot of money in useless appliances or things which are not badly needed. A great deal can be wasted in that manner. But at the same time, build or buy such things as will enable you to care for your flock more economically or in a manner that will increase the growth of your fowls or increase your profits.

We have not attempted to describe or illustrate a device of any nature that we do not feel is really worth the time and money required to make

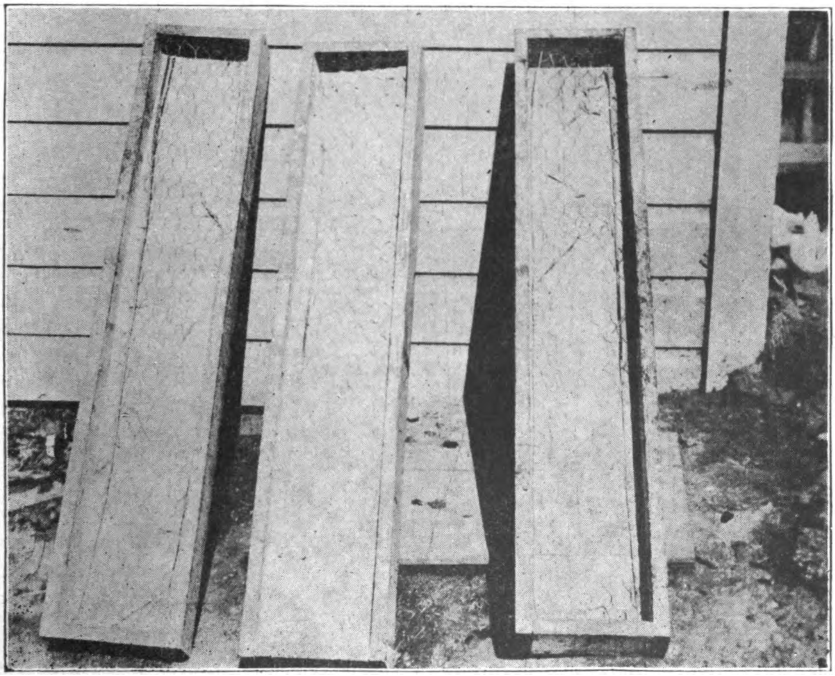


Fig. 1.

or purchase same, should it be needed by the poultryman. Some of the devices can be made by the poultryman himself, but in a few cases the appliance that is required must be bought.

FEEDING APPLIANCES FOR YOUNG CHICKS

Figure 1 represents rectangular troughs ranging in depth from two to four inches. These can be made about six inches in width and any length desired. They are used for dry mash. The one to the right is used to teach young chicks the use of the troughs. Ordinary one-inch poultry netting or hardware cloth is cut to fit the inside of the box. This is placed over the feed to prevent the chicks from scratching mash out of the trough. After learning how to get the feed from the trough and the chicks have become more active, a deeper feeder can then be used.

Do not fill the feeders more than half full, and place the wire over the feed, which will prevent chicks from scratching mash into the litter and wasting it. These troughs are used until the chicks are able to get their food from a hopper that is more sanitary. The second trough is three inches deep; the third is four inches in depth.

If a strip of lumber about an inch square is nailed in the center of the top of this feeding device so that it extends through the center from one end to the other and makes a sort of division in the feed trough, the chicks will be forced to stand and eat from either side, rather than to get in the hopper with their feet. Some will get in, in spite of everything that you may do, but this helps to prevent that to some extent.

Fig. 2.

Figure 2 is an inexpensive and easily made device for feeding young chicks. The cover is attached to two vertical end pieces which set loosely

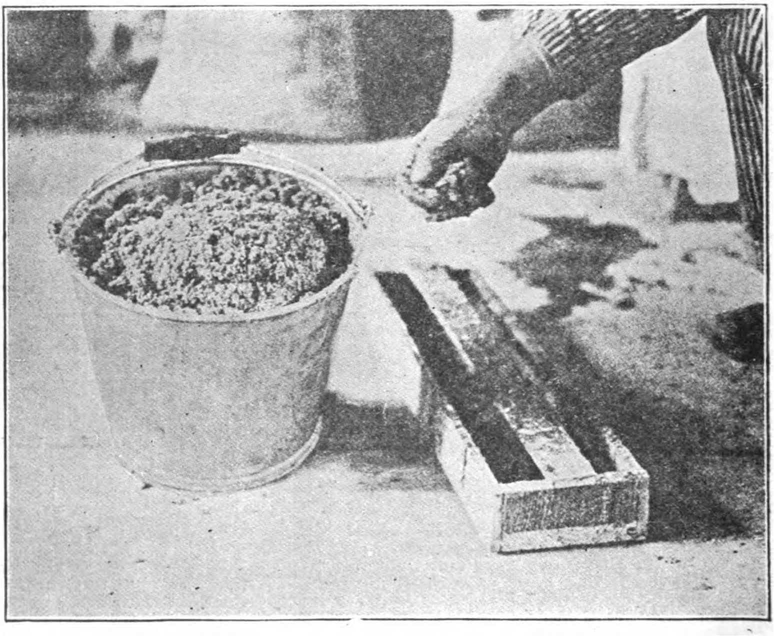


Fig. 3.

into a guide iron or galvanized tin nailed at each end. This allows the cover to be easily and quickly removed, so that the chick feeder can be refilled or easily cleaned. The top helps to prevent chicks from getting into the hopper to some extent. The top is held in place by screws, which set against the guide iron or tin, and keeps the cover at a desired height. At times it is found necessary to place a frame just above the top edge and to fasten wires every three inches across this frame. This will prevent any wasting of the feed. The frame is removable to allow easier cleaning of the troughs. The troughs are about three inches wide and three inches deep.

Figure 3 shows one of the chick feed boxes or troughs, which is being used for the feeding of moist mash. The mash is first mixed in a bucket or large galvanized pan or container made for that purpose, or it may be moistened in a galvanized half-bushel. No more moist mash should be fed at any one time than the chicks will clean up within 15 to 30 minutes, and the feeding devices should be thoroughly cleaned before the fresh feed is placed in same. These strips that are nailed through the center of the feeding boxes help to prevent the chicks from soiling the feed. The above feeding trough is made about six inches wide and about two and one-half or three inches deep. Dry mash or moist mash may be fed in such troughs or feeders.

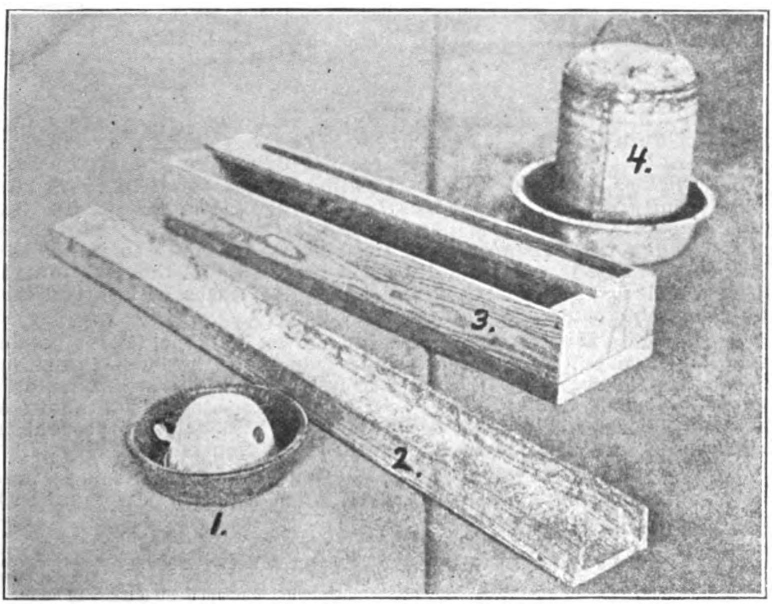


Fig. 4.

Figure 4 shows two devices for watering young chicks that are newly hatched, and also two of the feeding devices. No. 1 shows an ordinary galvanized or granite pan in which may be placed an inserted teacup, granite cup or can, simply for the purpose of preventing the chicks from getting in the pan, so as to avoid getting wet, and to prevent them from littering up the water or milk.

No. 2 is an ordinary board that is six inches or a foot wide with a two-inch strip nailed on the side to prevent the feed from easily being scratched off of the feeding board. This can be used for feeding the rolled oats bran and hard boiled eggs as a first feed for the chicks, and it can be used later for feeding moist mashes. You will note that the ends of this feeding

makes it easy to clean the trough. If a device of this sort is used for device are open, which permits the chicks to enter from either end, and growing stock or laying hens it is best to use a board that is 10 inches or a foot wide as the bottom of the feeder. It is also necessary to tack cleats on the bottom of the feeder to keep it up off the ground, and to prevent the sun and rain from cracking or warping it.

No. 3 is another one of the feeding devices described in figure one.

No. 4 is a home-made fountain with which to feed sour milk, buttermilk or water to the young chicks. A shallow pan may be used for that purpose and a tin can may be used large enough to almost fill the pan. There should simply be room enough between the can and the side of the pan to permit the chicks to drink freely. Holes may be punched in the side of the can or fountain, so that the holes will come down inside of the pan and just high enough to permit the water or milk to run almost to the top of the pan. The fountain can be filled and the pan placed over it and then turned quickly to the position shown in the illustration, and the fountain will fill of its own accord.

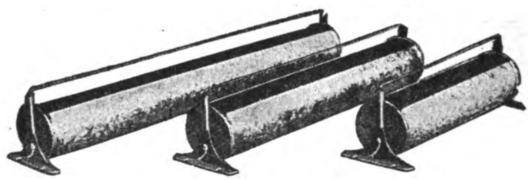


Fig. 5.

Figure 5 illustrates different sizes of chick feeders made and sold by the Norwich Automatic Feeder Co., of New London, Conn. We have found these feeders to be very satisfactory for use during the first two weeks after the chick is hatched. While cleanliness is essential in every stage of poultry culture, there is no department where it manifests itself absolutely necessary to a greater degree than in the raising of baby chicks. Thousands upon thousands are sacrificed every year due to the unsanitary conditions, chiefly due to pollution in the feed, and there is no doubt that the dreaded White Diarrhea and kindred diseases will spread more rapidly from this cause than any other.

These feeders are sanitary, and being convex in shape, it is impossible for the chicks to pull out or scatter the feed until the chicks are three weeks old or older. After that age it is necessary to use some other feeder, for you will find that they will begin to waste considerable feed. These are fitted with a removable guard rod which helps to prevent the chicks from getting into the feeder, or from roosting on it.

The body of the feeder is made of galvanized iron. As it is water tight, it may be used for mash chick feed or sour milk with equal satisfaction.

Fig 6.

Figure 6 is a chick feed trough that is made by the Oaks Manufacturing Co., of Tipton, Ind. These troughs are very convenient for feeding flocks of baby chicks. The trough proper is made on the half circle so that every bit of feed can be easily eaten out of it. Over the top is a gable shaped cover which prevents the chicks from getting into it and wasting the feed. This cover is a separate piece and slides on and off easily. The troughs are made of galvanized iron, and are reasonably strong and durable. The chicks eat through the openings in the sides of the cover. A few of these troughs are very convenient to use in starting the baby chicks.

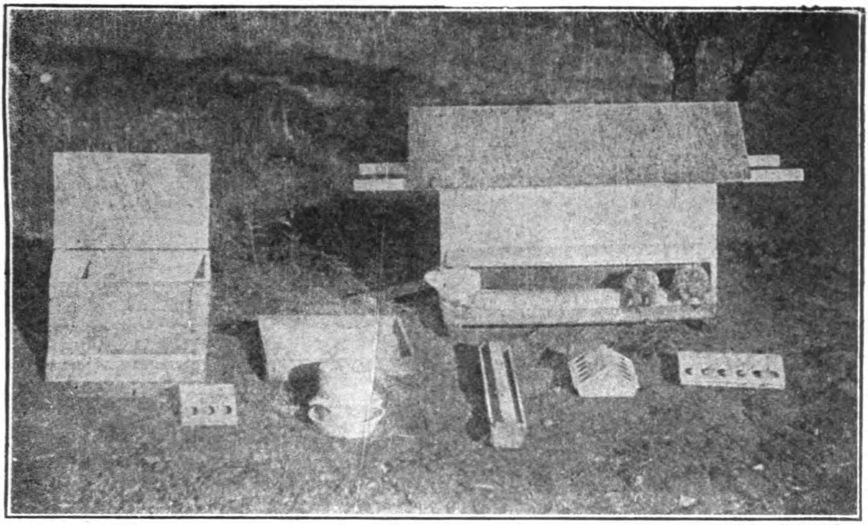


Fig. 7.

Figure 7 shows various styles of hoppers and feeders used from the time the first feed is given the baby chicks until the fowls are fully matured. You will notice the feed troughs and feeders in the foreground that are used in starting the baby chicks. The two larger hoppers in the rear are those used for feeding growing stock and laying hens. These larger hoppers will be illustrated on other pages. The smaller feeders have already been described.

PROTECTING THE CHICKS' FOOD AND FEEDERS

Figure 8 is a feed trough for baby chicks which protects the chicks from the sun, and also from the older birds. This device is especially

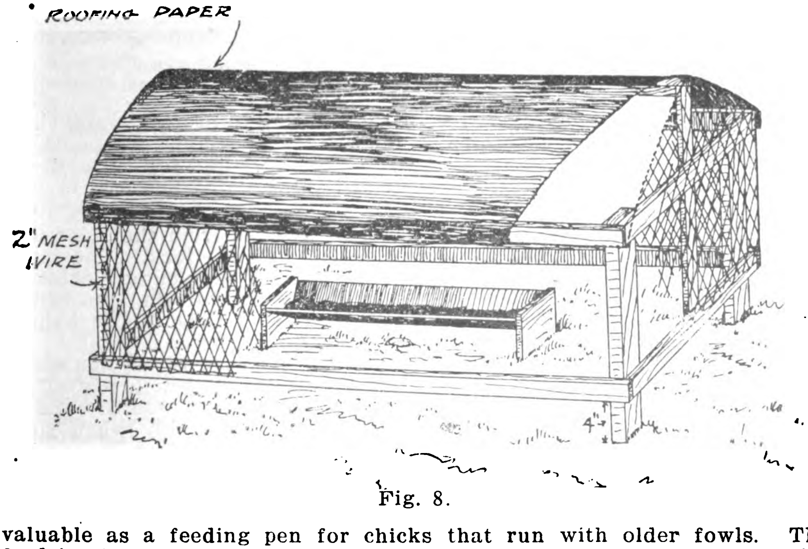


Fig. 8.

valuable as a feeding pen for chicks that run with older fowls. The feed is placed in the trough which is kept in the center on the interior

of the appliance, and the chicks reach it by going under the board sill which is about four inches above the ground. The top is covered with ordinary roofing material which makes the coop rain proof. This prevents the food from being spoiled and wasted in case of rain. Ordinary poultry netting is used with which to cover the sides and the ends of the pen. This prevents the older fowls from eating the high priced food that is necessary and intended for the baby chicks alone. It also prevents the young chicks from being trampled on by the larger ones. This coop can be built in any size that is necessary, depending entirely upon the size of the flock. The only dimension necessary to really observe is the height of four inches for the bottom sill above the ground.

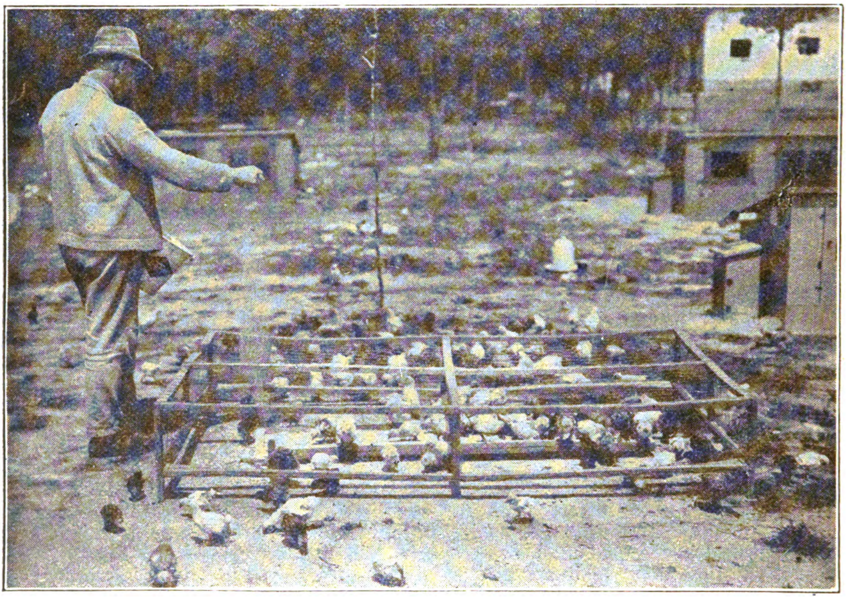


Fig. 9.

Figure 9 is a frame covered with wire netting to protect young chicks from the older fowls while being fed. This is simply a square pen built about 18 inches in height, and the end, sides and top covered with poultry netting. This can be built out of light framing material or most any scraps of lumber about your premises.

It is vital that the younger chicks be protected from the older ones, if chicks of different ages are being raised in one flock. The sill is about four inches from the ground, which permits the younger chicks to pass in and out, but prevents the older fowls from entering the feeding pen. These are made as light as possible, so that they can be handled by one or two men and moved to a clean feeding spot occasionally. Devices of this sort will save enough chicks in one season to pay the cost of same several times over. If the top was partially covered with roofing material so as to protect the feeder from sun and rain it would make the coop still more valuable. These coops are necessary only when young chicks are being fed and grown where there are older fowls.

Figure 10 represents a shelter. It may be used as a shelter to protect the feed trough or the drinking pan from the hot rays of the summer sun. It is also a refuge for chicks in case of hawks. These can be built in any dimensions, depending upon the purpose for which you intend to use them. The shelter here illustrated has a base that is 24 inches wide

and four inches high, and each section of the top is 18 inches in width. Only one side of the top is hinged, so that it may be raised and thus made more convenient when filling the trough or fountain. The opposite side of the roof is made stationary. It can be made high enough to hold any ordinary sized fountain without difficulty. This appliance prevents the sun and rain from beating into the hopper or fountain, and affords the birds some shelter while feeding.

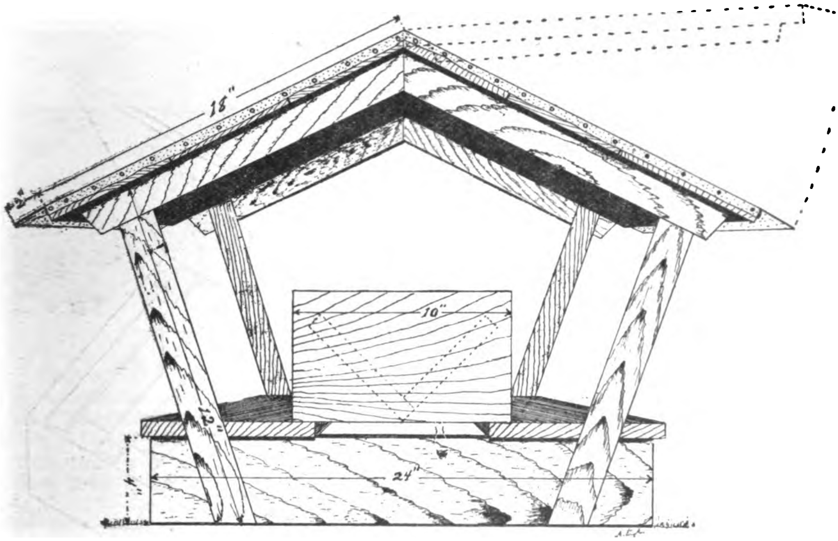


Fig. 10.

It can also be made so that it will protect the poultry feed from cattle where poultry ranges on the same ground. The eaves extend out over the roof two inches on the sides and ends. It can be made any length to suit the particular requirements of the poultryman. The troughs should not be allowed to extend the entire length of the shelter.

The sills are made out of 2x4 material, or if you want them higher from the ground you can make them out of 2x6's. All uprights, including the rafters, are made of 1x4's or 2x2's. If a person did not want to go to the trouble and expense of constructing outdoor hoppers, this appliance can be made to serve the purpose to some extent. It can be used for feeding either dry or moist mash.

FEED HOPPERS AND FEED DEVICES FOR DRY MASH

A feed hopper to fulfill its mission must be automatic. The hopper must be simple and inexpensive. A hopper must be so constructed that the feed will pass from the hopper proper into the feed trough without clogging and at the same time be so constructed that it will prevent the birds from wasting feed as they eat. The feed must fall down to take its place. To keep the hopper from choking it is necessary to give ample fall to the sides. In feeding mash it is often desirable to allow the fowls access for only a part of the day. For this reason it is better to have the hopper so constructed that it has a hinged door to close down over the feed place when necessary.

There is danger of the hens picking over the mash to get some desired food material, and often in doing this they flip out much of the mash on the floor and it is fouled and wasted. To prevent this, the feed part of the hopper should have ample depth and protection to keep them from getting into and drawing out the feed. A hopper so constructed that the fowls waste much mash is an expensive fixture.

Dry mash for feeding of chicks calls for the use of hoppers or feed devices of some sort from a few days after the chicks come from the shell until the close of their lives. The hopper feed method is a saver of labor and the keeper of large flocks must use every effort to save steps. It has become a practice everywhere, and this demand has brought various devices on the market, most of which could be made at home. A feed trough is a simple device for starting chicks so they can get to the feed better than they could in a hopper attached to the wall.

DRY MASH HOPPERS

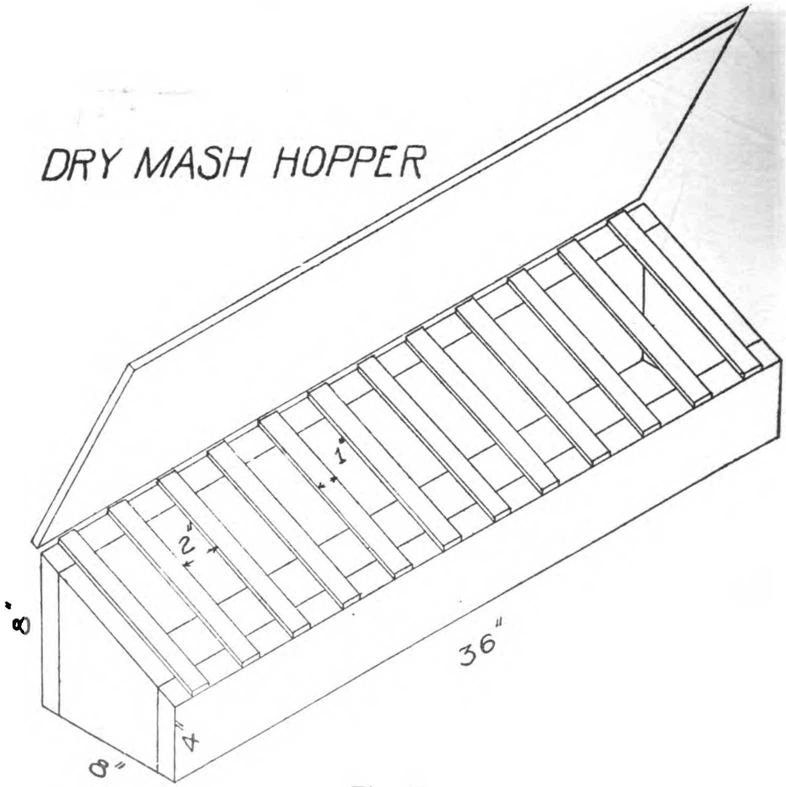


Fig. 11.

Figure 11 shows the dry mash hopper that can be used in the interior of the poultry house in which to feed growing stock and laying hens. The base of the hopper is 8 inches in width. This permits the birds to stand in front and reach the food even in the back of the hopper. The front is 4 inches high and the rear is 8 inches in height. The hopper can be built in width as desired. We usually recommend building them just the length required for the space in which they are intended to be used in the poultry house. There is a lid that covers the hopper, which is hinged at the rear, so the hopper may be closed and the feed protected from the birds in case it becomes necessary to do so for any portion of the day.

It is also a good idea to have a slatted door, such as is shown in the illustration. The slats being one inch in width and placed two inches apart. This slatted piece should be made so it can be hinged at either the back and front of the hopper, or else constructed so that it may simply be laid over the hopper and remain stationary. This prevents the birds

from getting into the food. The slats, which are two inches apart, permit the birds to eat freely from same. You will find this is a splendid device for feeding dry mash to any age birds from three weeks to full grown fowls. It is a hopper that can be easily cleaned and refilled. The lid is left open when in use, but is closed when necessary to prevent the birds from consuming too much food.

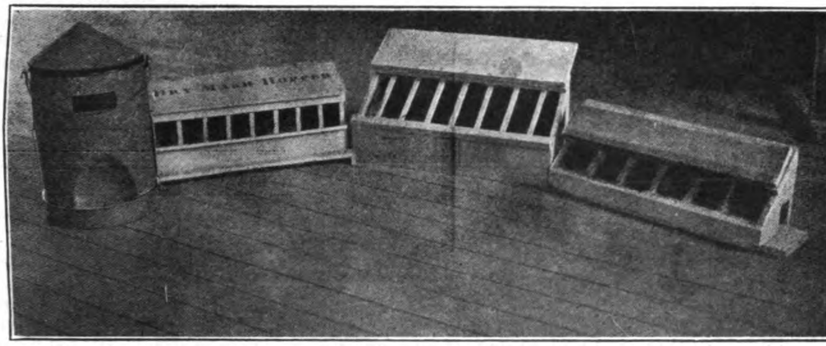


Fig. 12.

Figure 12 on the left illustrates a galvanized drinking fountain, such as can be bought from most any poultry supply dealer. The bottom of the fountain can be removed and the fountain inverted when being filled. The bottom is then placed in position and the fountain suddenly turned into position shown in the illustration. The water gently flows to the small opening in the front where the chicks are permitted to

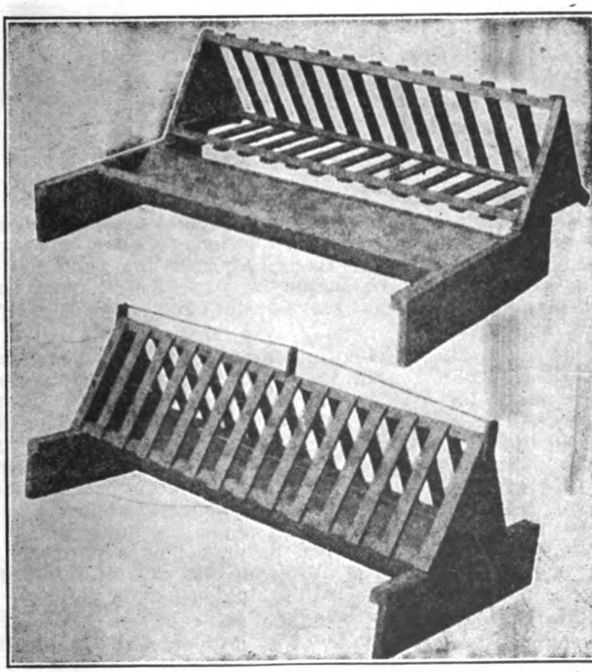


Fig. 13.

drink. The first hopper on the left is 8 inches deep. The lid of same has a 2-inch slope from the front to the rear. From the bottom of the hopper to the opening where the fowls feed is a space of 4 inches. On the front is nailed a strip about one inch in width at the bottom of the slats and the strip slants at an angle of 45 degrees. The feed that is flipped out by the birds then falls back into the hopper. The slats in front are nailed about 2 or 3 inches apart, depending upon the age of the birds for which it is intended. The hopper can be built any length desired. A 2x4 is placed on each end of the hopper to support it from the ground, and these extend out 2 or 3 inches in front of the hopper. This permits you to tack a 1x4 along the front so that the birds can stand on the front of this and eat out of the hopper. The device shown in the center is the same as that described in figure11. You will find this one of the simplest and cheapest hoppers that can be made. On the extreme right is illustrated a wall nest which is described on another page in the lesson.

Figure 13 is a V-shaped trough. It has a slatted protector to keep the fowls from getting into the feed. The trough can be made out of ordinary 1x6 material, and is adapted to feeding growing stock and laying hens. It is especially valuable in feeding moist mash or sprouted oats. It is convenient, easily made and easily cleaned. The cover is made of slats which are placed about 2 inches apart and is made on a frame which is hinged for convenience in feeding. This prevents the birds from crowding into the trough and soiling the feed with their feet. The two main things to guard against in feeding moist mash is to keep the fowls from soiling the mash with their feet and not to feed so freely that the birds will not consume all the food and allow it to remain in the trough to become sour or mouldy.

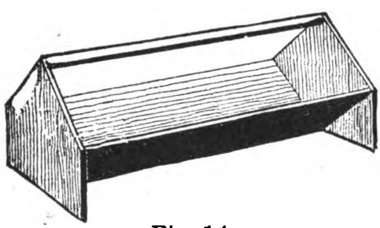


Fig. 14.

Figure 14 is a V-shaped feeding trough which is easily and cheaply constructed. A piece of 1x2 material is placed across the trough running through the center. This acts as a protection, to some extent, in keeping the birds from getting into the trough and soiling the food with their feet. It also acts as a handle in moving the trough from one place to another and makes it somewhat more rigid. It helps to prevent the ends from coming apart.

Figure 15 shows a non-clogging, non-wasting dry mash hopper. In the upper section of the hopper there as a storage capactiy for a week's supply of dry mash for a flock of 100 laying hens. The hopper is non-clogging because the sides are straight up and down. The objection to the open style hopper is that it permits the birds to stand in the food so that it soon becomes soiled. Some hoppers are so constructed that they clog and when you make the openings wide enough so that the mash will fall down, many hoppers then waste feed. A hopper like that illustrated can be installed in a partition of a poultry house so that the birds may feed from either side, or it can be placed on a platform indoors or out of doors as may be required. The bottom part of this hopper works satisfactorily if not filled too full, in which case it is liable to waste.

With this style one is spared the sight of his hens struggling to reach their mash along the side of a hopper, half the open space of which is covered by slats. Again one is spared the trouble of poking with sticks or the employment of other methods for freeing most of the so-called, non-clogging hoppers. In this hopper we have storage capacity

for a week, but supply only enough for a day's feeding by drawing out the slide in the bottom of the storage bin until that quantity has run out. This slide will not join or clog if made with a fairly loose fit.

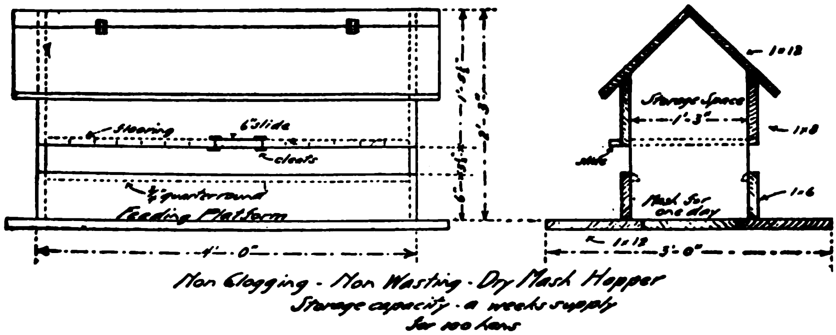


Fig. 15.

The bottom of the storage bin may be made of ordinary flooring or ship-lap. The top is made of 1-inch boards with one side hinged for inside use, or it can be held in place by cleats.

For the out-of-door hopper, the top should be made with a greater over-hang and covered with roofing paper. Of course, all dimensions given are arbitrary, but we have found this width to be most satisfactory as the hens can reach to the center from either side. The lumber should be surfaced at least on one side and that side should form the inside of hopper to prevent injury to combs. It is well also to round the edges along which the hens feed.

With the hopper shown and described here, it is impossible to waste feed if the hopper is not filled too full, neither will it clog. But if the hopper is filled so high as to allow the hens to bank the mash up against the edge, then there is danger of feed being wasted. The same principle in constructing the hopper for feeding dry mash to young chicks and

Fig. 16.

growing stock can be used except that instead of 6-inch sides you should use narrower strips, depending upon the age of the chicks, where again the dimensions are arbitrary. The length should be governed by the number of birds in the flocks. The openings along the sides should vary in width from one-half inch for young chicks to three inches for grown fowls.

Figure 16 shows two sizes of the Norwich Automatic Feeders and Exercisers made by the Norwich Automatic Feeder Co., of New London, Conn.

We do not ordinarily recommend automatic feeders for grains, for in most cases we believe that grain should be hand fed, but this feeder has proven one of the best of the kind that we have ever used. This hopper is rain proof, rat proof and also dust proof and may be placed on the outside of your building if you find it necessary to do so. These hoppers are better for the feeding of laying hens than they are with which to feed breeding stock, as breeding stock should really be hand fed.

The machine consists of a hopper sufficiently large to carry a given quantity of grain feed, in the bottom of which is fitted an adjusting valve, which is set to allow such quantities of feed to escape from the hopper as may be desired. Directly under the valve is located the Deflector and the feed, passing from the hopper through the valve, falls at once to the Deflector, and by it is scattered on the ground or floor in a wide, even circle. The Bait Bar which is the cross piece under the Deflector (resembling an ear of corn) is connected by an adjustable rod with a small agitating disc which performs the double duty of acting as a stop to the valve, and stirring up the feed about to be delivered. The machine, as will be observed, is mounted on three adjustable iron legs so it will stand in any yard, whether level or located on a hillside, and may be used alike for baby chicks fresh from the incubator or the adult fowl, by simply lengthening or shortening the legs as desired.

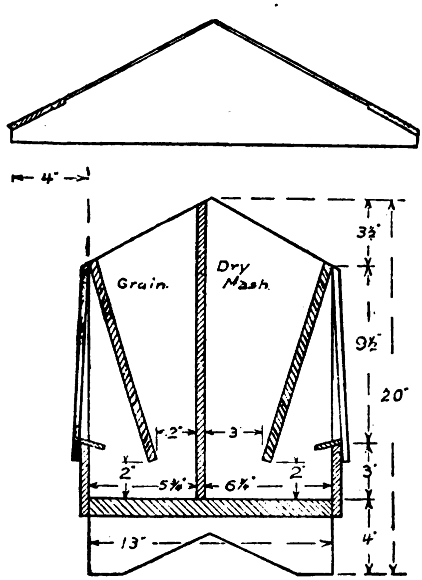


Fig. 17.

The Bait Bar is hung on a rod which is attached to the agitating disc by set screw, and under the Deflector the rod is held by a cross piece, so its true position is assured. The Agitator is protected by a shield to carry the weight of the grain in the Hopper and is relieved of all friction, and as the fowl touches the Bait Bar, giving it but the slightest peck, it turns away from the bill, thus absolutely and positively obviating any

soreness or damage to the mouth, and, in turning, operates the disc, which sends a regulated shower of feed onto the Deflector, and it is thus scattered. A tooth or prong on the disc covering the openings in the valve, instantly checks the flow of feed, and whether or not litter is placed under the machine, the fowl will at once begin a scratching and hunting till grain is found and eaten, when another will peck at the Bait Bar, and down will come another supply of feed. Thus the stock is kept constantly in motion while feeding.

Figure 17 shows a cross section of the double dry mash hopper. The dimensions are also given for the construction of same.

This is a slatted front, out-door hopper, and one should be kept near each coop where the laying hens or growing stock are permitted to range. This hopper will enable you to feed your chickens once a week and thus save labor. Grain can be kept on one side and dry mash on the other. This shows the bottom and ends of the hopper made of one-inch boards, and, if it is possible to obtain same, the sides and partitions should be made of one-half inch material. The partition may be made of ordinary roofing material instead of boards. Inch square strips of box boards may be cut to which you can tack the ends and bottom edges of the middle partition. And then those strips of boards should be securely nailed to the ends and bottom of hoppers securing the partition firmly in place. Two laths or strips of batten should be nailed together along the top edge of these partitions, making a sort of a ridge pole.

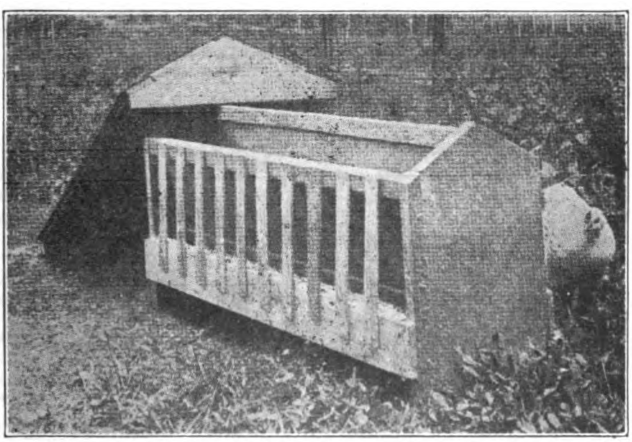


Fig. 18.

Figure 18 is a view of the double dry mash hopper with the cover lifted. The slats in front are made of pieces of lath planed smooth and set two inches apart. Along the front is nailed a lath set so that it slopes inward as shown in the drawing of cross section. This tends to prevent the chicks from throwing out food as they are eating. If any is thrown up onto the sloping top, it slides back into the hopper. A little food is likely to be thrown out in spite of precautions. The cover of this hopper is made sloping like a roof and the eaves project four inches over each side. The ends are cut from light weight box material and strips of the same material, three inches wide, are cut for the support of the eaves. Two or three laths are nailed lengthwise between the eaves and ridge to support the roofing fabric which forms the cover. A hook and screw eye at each end secures it in place so that the wind cannot lift the lid off and expose the food to rain. Make a considerable projection on the eaves to protect the food from rain.

Figure 19 shows this hopper complete and chick eating from same. By making the roof and the partitions of compostion roofing, it makes the hopper very light, so that it can be easily moved. These hoppers are made three feet long, thirteen inches wide and twenty inches high at the top of the cover. A hopper of this size will hold sufficient food for 30 to 40 growing pullets for a week. It will be noticed that the parti-

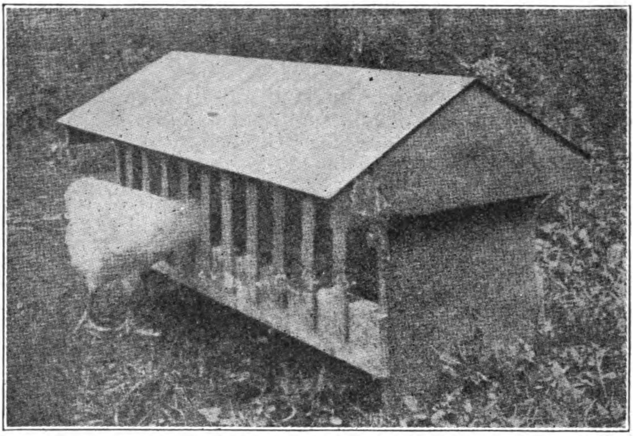


Fig. 19.

tion which divides the hopper in half is not in the exact center, but that it is set over one inch from the center so that the throat of the dry mash side shall be an inch wider than the throat of the side for the grain. The mash flows less freely than does grain, and hence it is desirable to have an inch wider throat on that side for that reason.

This hopper will prove very satisfactory, very simple and inexpensive for a city poultry raiser or where poultry is kept in small flocks.

Figure 20 is an illustration of a dry mash hopper that can be used either as an indoor or as an outdoor hopper. This shows the base of the hopper to be 20 inches wide. You will note there is an A-shaped partition in the center of the hopper which is made of four-inch boards. The distance between the side of the hopper and the partition is two inches, and the mash flows through this space. The feeding troughs on each side are 6 inches high and the walls of the hopper are 18 inches in height. The lids are hinged so that grain can be put on one side and mash on the other. If the hopper is to be used on the outside of a building, then it is advisable to tack a strip of rubberoid roofing over the lid so that this will extend 4 to 6 inches over the edge of the lid, which helps to prevent rain from beating into the hopper proper. There is a handle made on each end of the hopper for convenience in carrying same. The base of the hopper should be built on 2x4's, which prevents the feed from absorbing moisture from the ground, and these 2x4's should extend out about 4 inches on each side of the hopper and on these should be nailed a 1x4 as a running board so the chicks can stand on the board and eat from each side.

Figure 21 shows partitions made in these hoppers so that grit and shell can be used in different sections, grain and mash in other sections. However, our experience has been that it is best to divide the hopper the long way and place the mash in one side and the grain in the other. The grit and shell can be fed in smaller and less expesive hoppers and boxes.

Figure 22 pictures a bunch of cockerels out on range that are using one of the above hoppers. You will note that the rubberoid roofing extends down over each side and is tacked on the underneath side of the lid to prevent rain from beating in. You will also note the run-way on the side of the hopper and the chicks standing on same. The partitions in the hopper run the long way. These hoppers can be built in any lengths from 3 feet up. Do not build them so long, however, that they are difficult to handle.

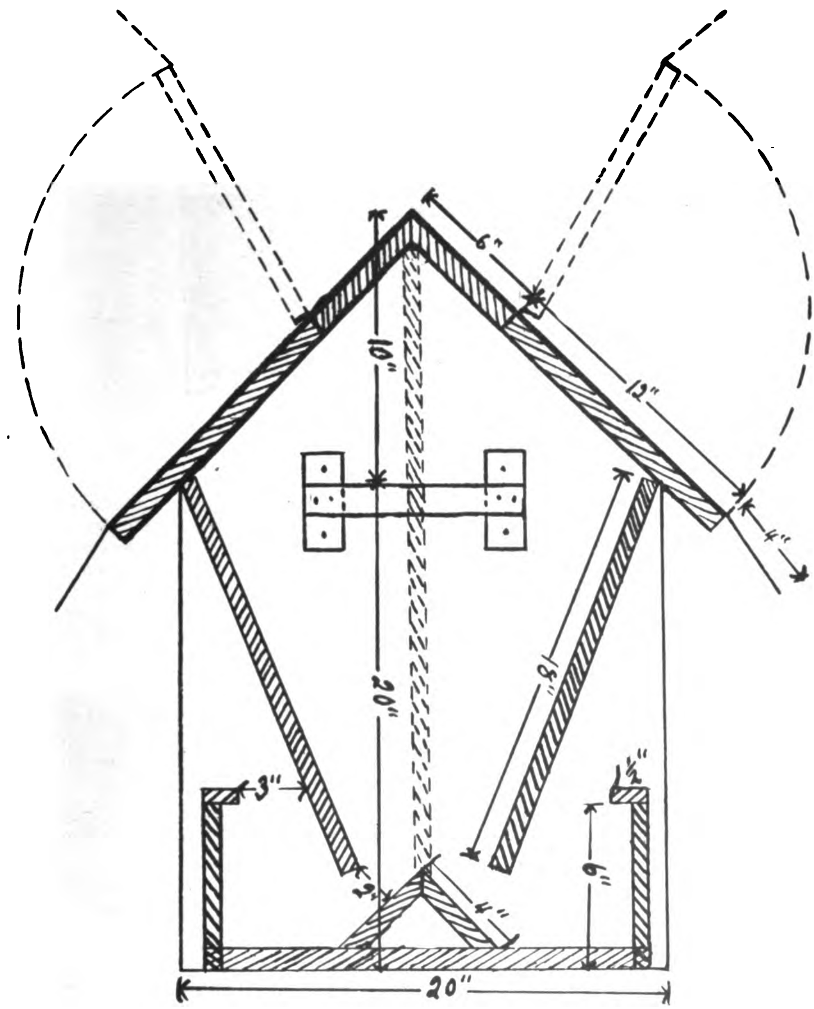


Fig. 20.

Figure 23 shows practically the same hopper with the same dimensions, method of construction, etc., except that only one side of the hopper is used. It is made in this way so that it can be used along the wall of a poultry house. The back side is placed against the wall in some convenient place and it is usually best to place these hoppers on a table that is built about 2 feet high and wide enough so that there will be 6 inches of space in front of the hopper for the birds to stand on. Any of the home-made double hoppers that are illustrated in this lesson can be

divided in the center as shown in this illustration, and the hopper is thus made suitable as a wall hopper for a poultry house. If the hoppers are to be used on a table that is placed in the center of the room, the double hopper can be used so the birds can eat from either side. You will note the wires on the slats that are placed across the mouth of the hopper to prevent the birds from flipping the grain and mash from same.

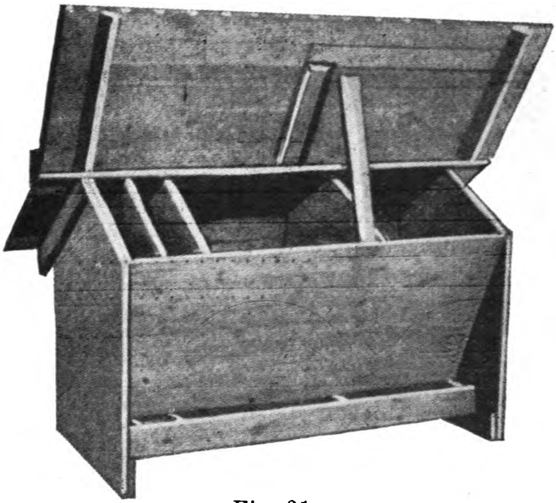


Fig. 21.

Figure 24 shows a cross section of a hopper which has features that are an improvement over any of the double hoppers mentioned above. The construction is very similar with the exception of two changes. You will note that the bottom of the hopper where the mash is shown, is circular. This is made by making this portion of your hopper of galvanized iron. However, if the irons cannot be obtained, wood may be used and the bottom of the hopper is made of boards, with the exception that we

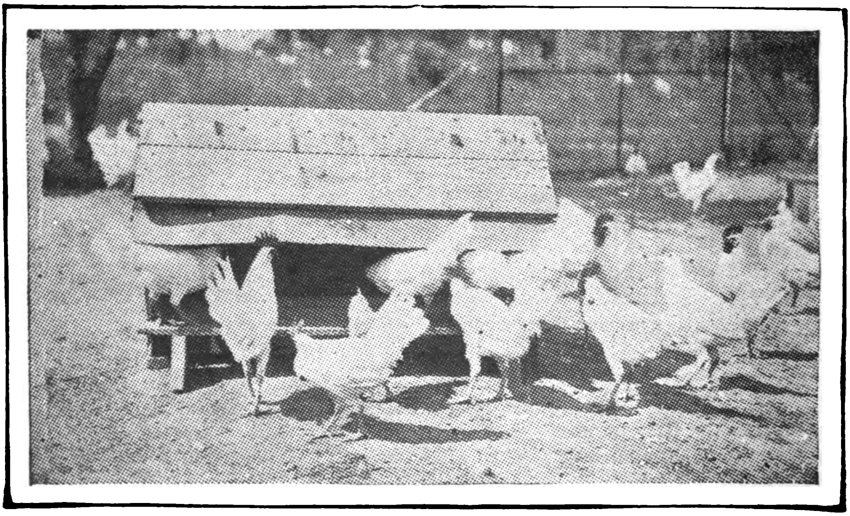


Fig. 22.

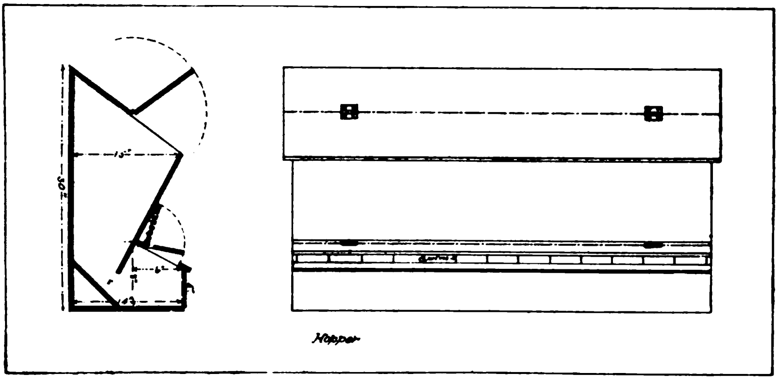


Fig. 23.

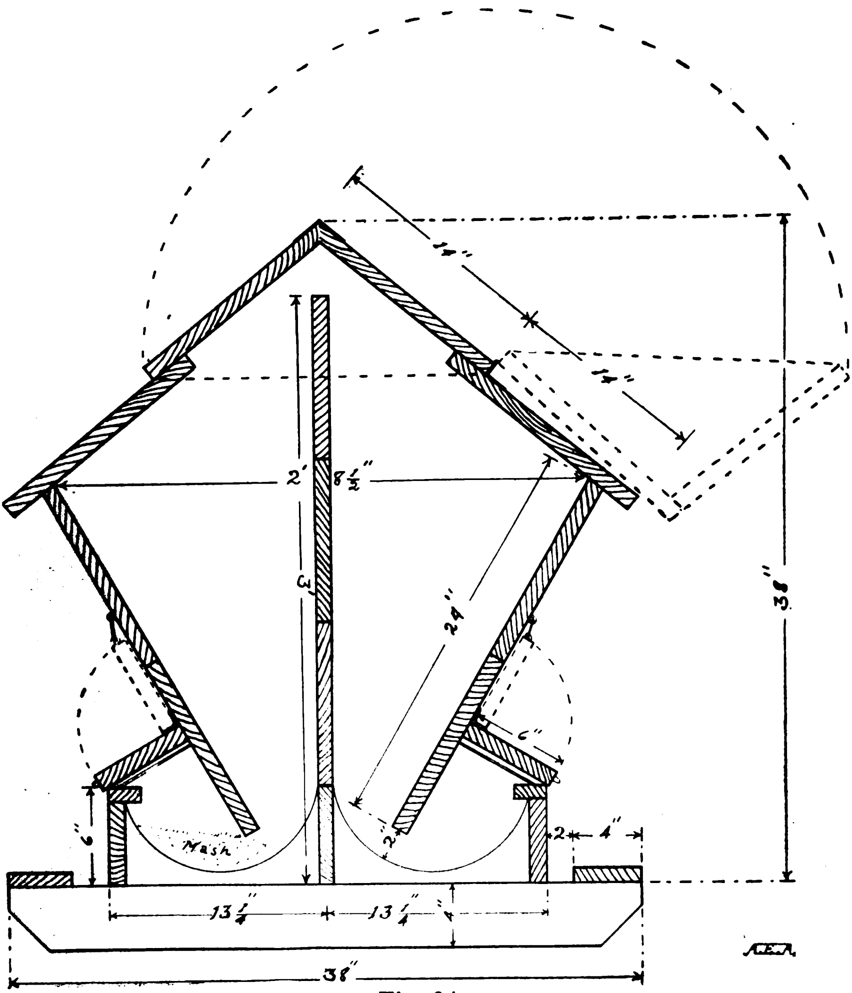


Fig. 24.

would add the A-shaped partitions in the center in the bottom as illustrated in Figure 20. Another improvement is the construction of the top or lid. You will note that the main portion of the lid is made stationary, and the uppermost top is hinged on one side and folds back out of the way while the hopper is being filled. This gives you a lot more capactiy for feed for the reason that your hopper can be filled almost to the top, which is several inches above the eaves. You will also note that the hinged portion of the lid overlaps the lower portion of same, which makes the hopper rain-proof and makes it especially valuable as on outdoor hopper. Also composition roofing may be used to tack on the underneath side of the lower portion of the lid.

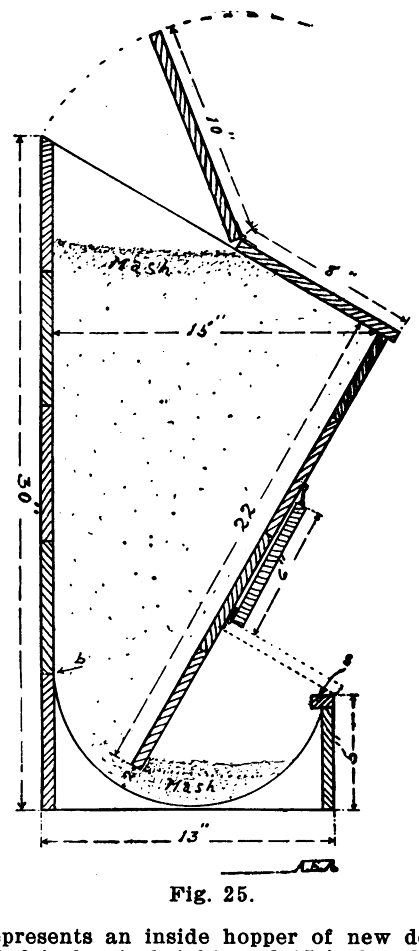


Fig. 25.

Figure 25 represents an inside hopper of new design. It is made 4 feet long, 2 feet 6 inches in height, and 15 inches deep. In constructing this hopper, a 12-inch circle should be cut, which could then be cut in two with the wood grain, and one of these pieces nailed onto each end of the hopper on the inside, over which the trough bottom is formed by tacking sheet-iron or galvanized iron onto this. The sheet-iron should be about 20 inches in width and 3 feet 10 inches long. This sheet-iron is then nailed onto these semi-circles from below by first running through the rear or back of hopper at point "b" and from there to the front upright where it is again tacked from above. Strip "S" is then nailed on over this to retain the sheet-iron rigidly in place. How-

over, the iron should not be tacked at the front until you are sure that the distance or opening of the throat is just two inches in the clear to allow the proper amount of mash to pass through, not over filling the trough. On the other hand, if it is made too small, it will not permit a free passage of mash, causing the hopper to clog. This hopper, like the large one, is designed with a view to large capacity and is a perfectly sanitary hopper in every particular. In the old style of hopper the mash had a tendency to accumulate in the corners and remain there uneaten, due to the fact that as soon as the fowls had eaten out a small portion of the trough's contents, a fresh supply would rush down upon the old mash, continuing to do so as long as there was any mash left in the hopper, never permitting the birds to eat the stagnant mash which would become molded and unpalatable, as well as unhealthy for consumption. This hopper, shown in the drawing, will eliminate these objections, inasmuch as it compels the mash that first goes into the throat to be eaten first by the fowls. Its under-force system of feeding prevents any mash from accumulating in remote corners of the trough. No further bottom is placed in this hopper than the sheet-iron. The first boards in the back of the hopper are six inches wide, over which the sheet-iron is passed, there being no objection to running the iron up further.

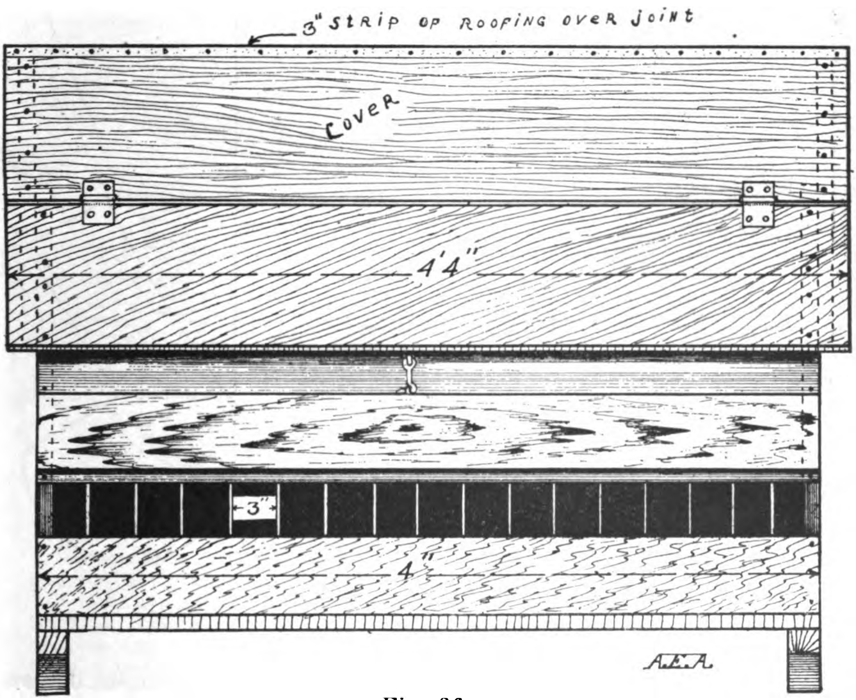


Fig. 26.

Figure 26 shows a side, exterior view of the single and double hopper. This shows the lid of the trough raised so the birds may eat through the wires which are placed three inches apart. These wires prevent the birds from flipping the feed out of the hopper. You will note that the cover is hinged so that the top portion folds downward.

Figure 27. This is practically the same hopper made in the same way as that described above, except that it has a double trough so that two rows of birds may feed from the same hopper. One row of fowls may

stand on the upper 10-inch running board, and another row of fowls may stand on the lower 4-inch running board. The running boards are so placed and constructed that droppings and litter from the upper row do not fall on the fowls below. You will also note the difference in the sections of the lower portion of the hopper, there being no board on the rear or outside portion of the sheet metal or galvanized iron. This has been found not to be necessary. This style of hopper can be constructed so that not only two rows of fowls can eat from one side, but by building

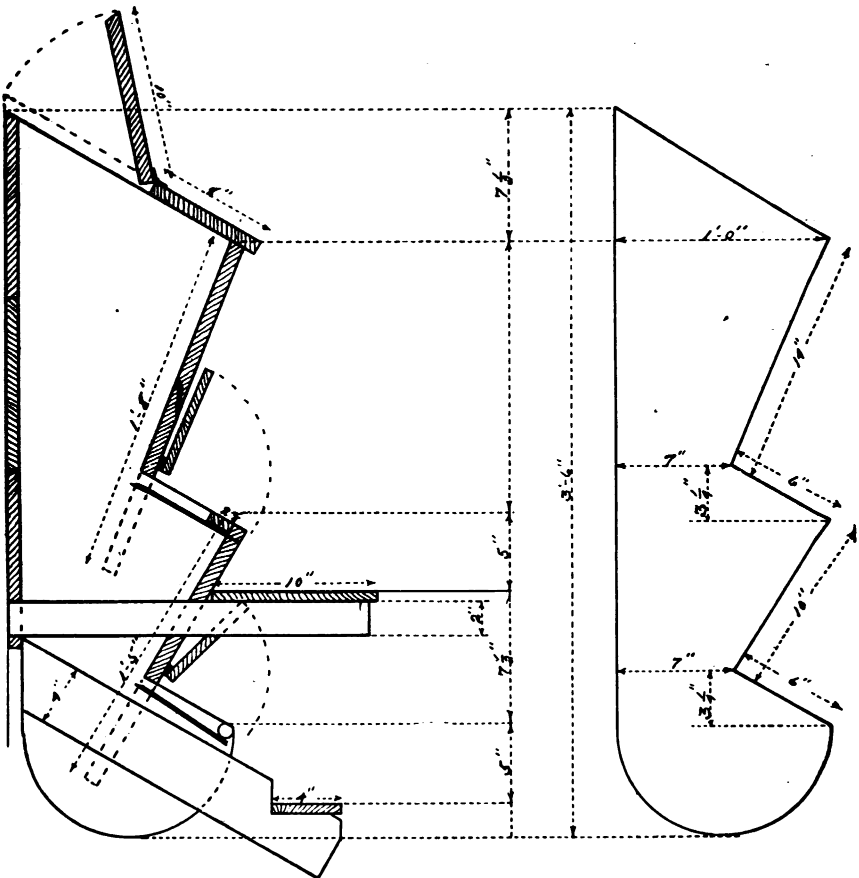


Fig. 27.

the hopper double, birds can eat from both sides. Where you are limited for hopper space in a poultry house, you can build a hopper like this with a double feeding trough which gives double the capactiy with the same amount of space. We have found this hopper to be very satisfactory.

Figure 28 shows a very large hopper built in the partition of a large laying house. This hopper forms a part of the partition and will hold several hundred pounds of feed. It is so built that it can be filled from above and if you have a two-story poultry house, the hopper should be filled from the second story. The double feeding hopper illustrated in Figure 27 is especially well suited for such use. You will note the fowls eating from the trough.

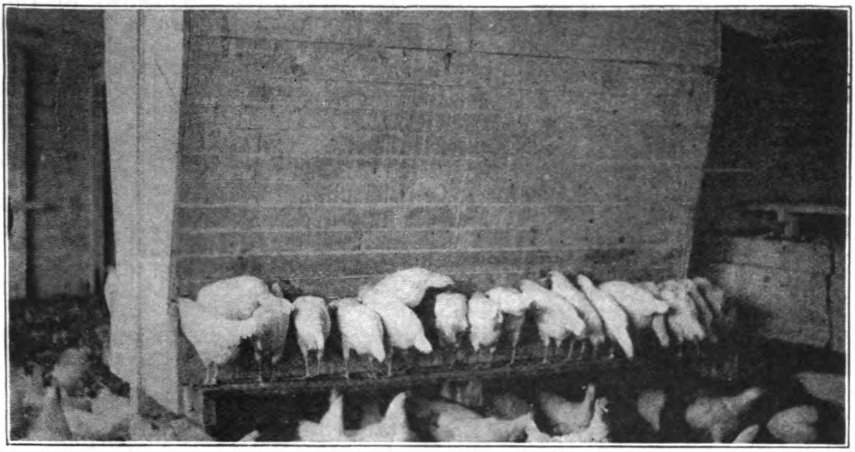


Fig. 28.

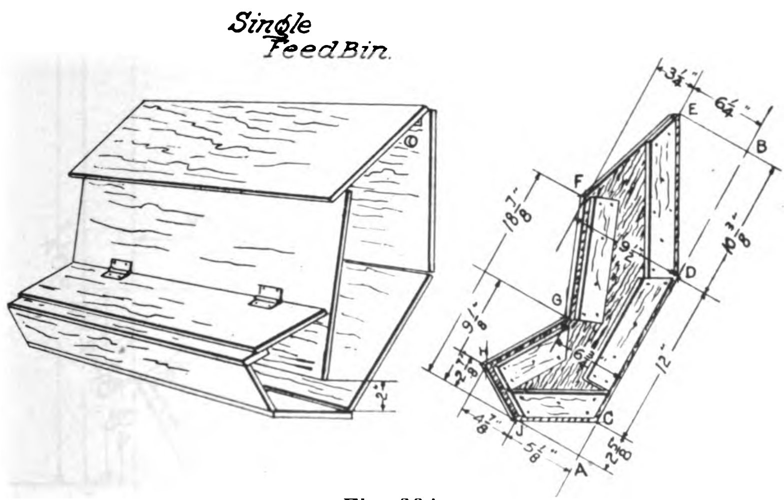


Fig. 28A

Fig. 28A. To construct the End Boards for the Single Feed Hopper proceed as follows:

Select a board about three-fourths of an inch in thickness, not less than 10 inches wide and 25 inches long. Use the edge of the board or broken line A B as a working line. Measure along this line 2⅝ inches from A to C, making a mark at C; then make a mark at D, 12 inches from C; then make a mark at B, 10⅜ inches from D. The board may then be sawed off at point B at right angle to the line A B, and then locate point E, 6¼ inches from point B.

Then beginning at A measuring across the end of the board 5⅛ inches to point J; then extend this line 4⅞ inches more to the opposite corner of the board 10 inches from point A; then along the edge of the board 2⅛ inches to point H; then locate point G, 9⅛ inches from the end of the board at J and 6¾ inches from the edge of the board A. B. Then locate F, 18⅞ inches from the lower end of the board and 9½ inches from the edge of the board A B.

To mark the board for sawing, draw a line from D to E, E to F, F to

G, G to H, H to J, and J to C. Then nail on the cleats as shown on the above illustration a distance from the edge of the end board equal to the thickness of the lumber used as walls for the bin so that the cleats will make the wall board come flush with the edges of the end board. When so constructed it permits of doubling nailing, thus making the bin much stronger.

Care must be used at point G in placing these cleats so as to leave a space for the front wall board of the bin to pass down below the feed trough lid, as shown in figure 28A.

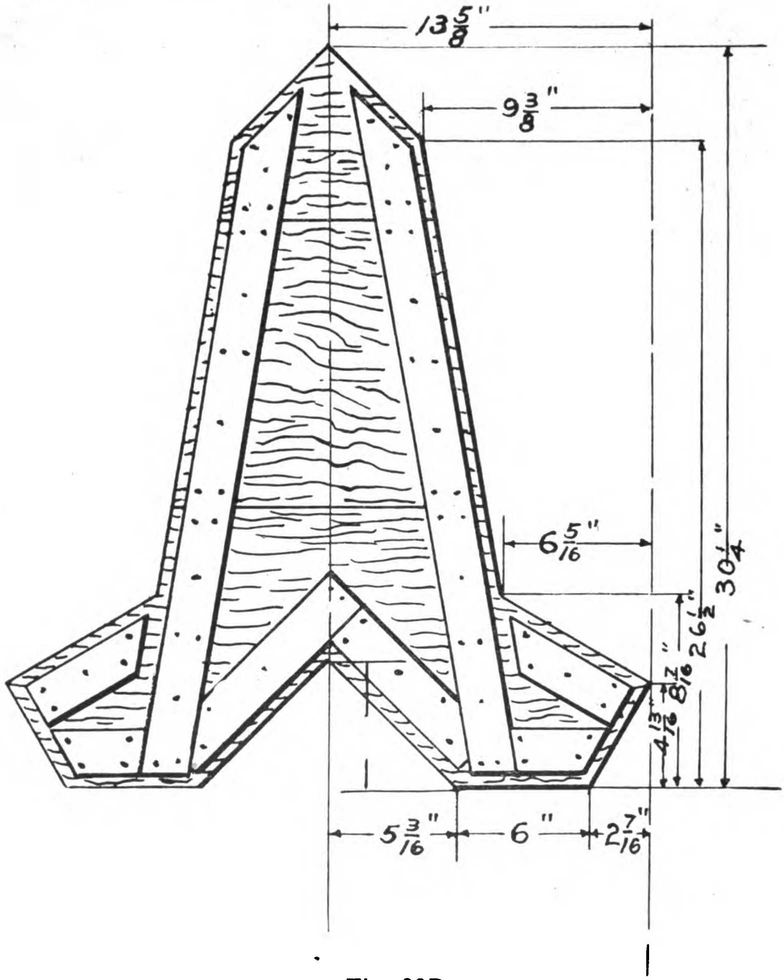


Fig. 28B

Fig. 28B.—The great difficulty with most mash hoppers is the fact that the ground feed packs, sticks, bridges over and refuses to feed down. If it does feed down freely, it has a tendency to waste. This non-choke hopper was designed with a view of avoiding this trouble. If the walls of the hopper or bin slope inward as much as one-fourth of an inch, the mash has a tendency to pack and clog. The hopper as shown in Fig. 28B flares at the bottom and there is no way for the feed to clog or bridge over. As long as there is any mash in the hopper it will feed down. Use the dimensions as shown in the illustration when constructing this style of hopper.

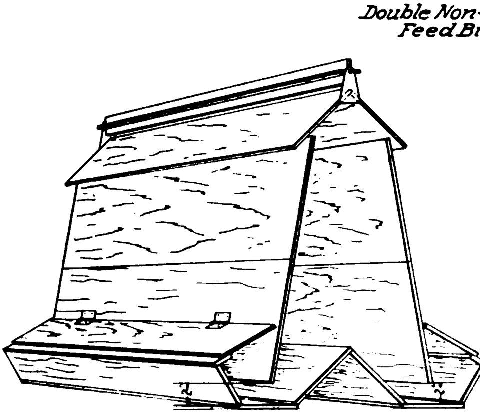


Fig. 28C

Fig. 28C.—This shows an end and side view of the non-clog hopper. There is a revolving device on top to prevent the chickens from roosting on same.

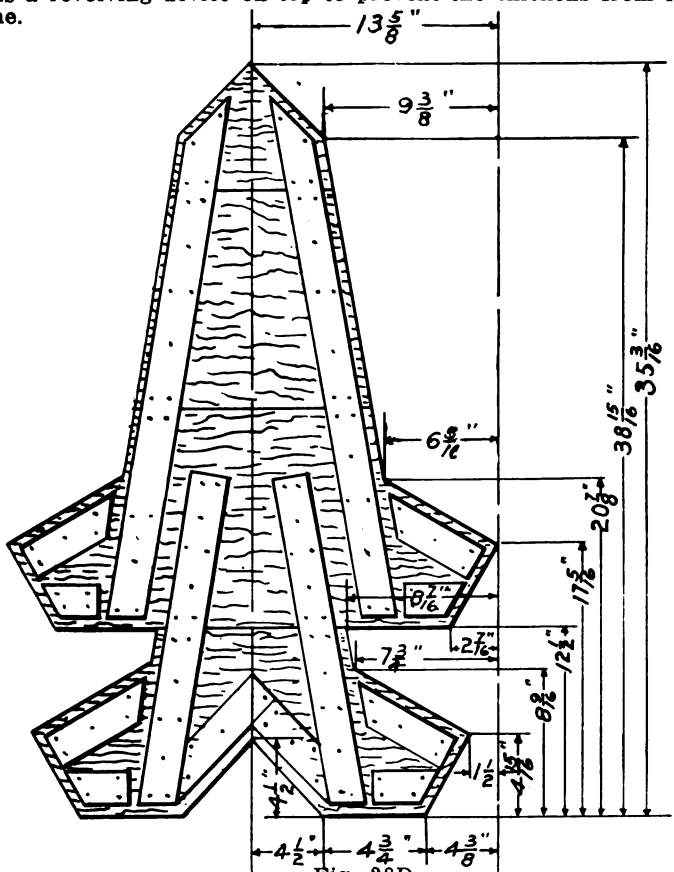


Fig. 28D

Fig. 28D is the same hopper as shown in Fig. 28B except that the hopper is built with two runways and two openings to eat from on each side so that you have double the eating space that you have in the single

hopper. The dimensions are shown in the illustration. The length can be made to fit the available space in the poultry house where it is to be used. The best position for such a hopper is in the center of the room or in a partition between two rooms of a poultry house.

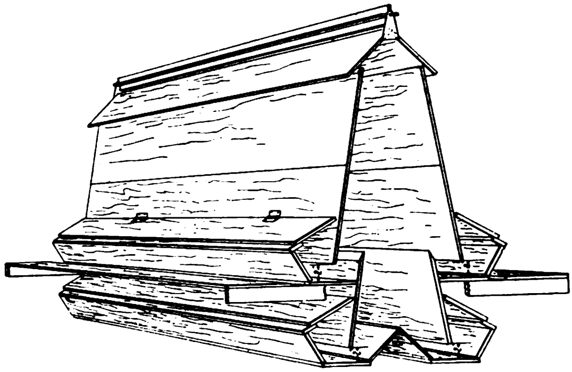


Fig. 28E

Fig. 28E shows the end and side view of the double non-clog feeder or hopper. The complete dimensions of this hopper are shown in illustration Fig. 28D.

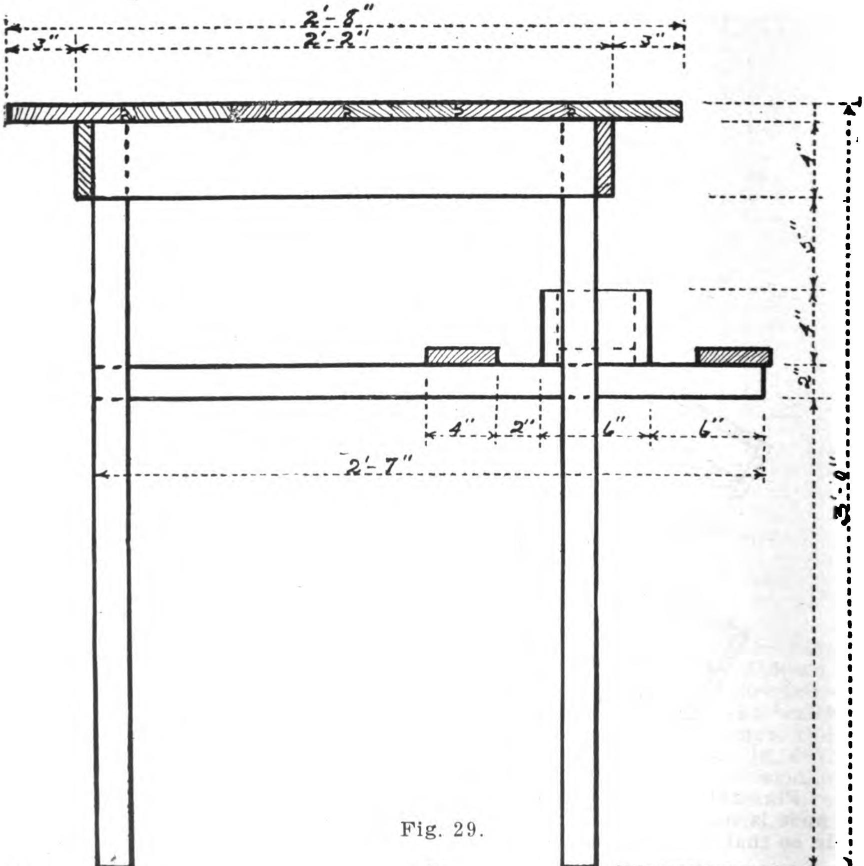


Fig. 29.

Figure 29 represents a table that is very useful in the average poultry house. This is a movable table, such as should be used on which to place hopper, drinking pans, etc. You will note a square trough placed between the front legs of the table. There is a 1x4-inch running board on each side of this trough. The trough is used in which to feed moist mash or sprouted oats and other special foods which you wish to give your birds from time to time. The running boards of each side permit two rows of fowls to eat from the same trough. The front running board makes an easy place for the birds to fly on and off when getting up to the mash hopper which is placed on the table. A table like the above protects the troughs below from filth and droppings.

OAT SPROUTERS

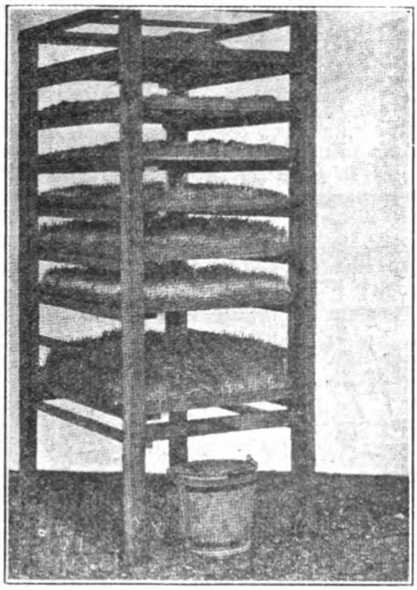


Fig. 30.

One of the best ways of supplying succulent green food in winter, or of reducing the feed bill, is through the medium of sprouted oats and very little time is required in their preparation; neither does the sprouter necessarily occupy but very little space. The sprouted oats are also better for the early hatched chick than most other forms of green food that are available. They possess a high feeding value if they are fed while the sprouts are not more than two inches in length. The sprouter can be placed in any ordinary basement, cellar or room where the temperature does not get below 50 degrees. The green food problem proves a difficult one for the average poultryman during the winter months or for the city lot poultry raiser who is compelled to raise a number of fowls on a small piece of ground and where the ground is more or less bare for a considerable portion of the time. For the above reasons, we have found it a very profitable thing for the average poultryman to sprout oats at least during that portion of the year when other succulent, tender green food is not available.

Figure 30 shows a tray of oats that has been sprouted. You can see that they are a mass of tender sprouts and roots. You have all of this tender, succulent green food in addition to the oat grain itself, which is practically as valuable for feeding as it ever was, providing the oats are fed within a week after they have been soaked for sprouting. The oats

are soaked in a bucket or vessel of water for about 12 hours. We usually measure out the oats each afternoon and cover them with water. They are allowed to soak in this over night and at feeding time the following morning they are spread out in trays in the oat sprouter until the oats are about an inch in depth. The oats are then sprinkled once each day, which is usually done in the morning when the trays are refilled. Each morning as the trays are emptied, the same trays can be refilled with oats which have been soaked.

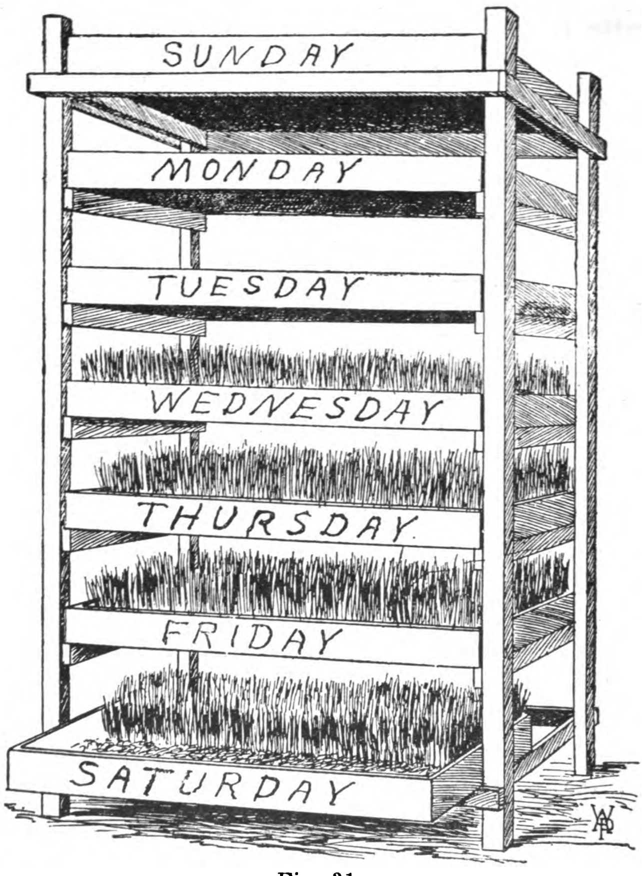


Fig. 31.

Figure 31 is an illustration of the rack and trays that are used for oat sprouting. The corner posts are made of 2x2 material. The slats which are used to hold the trays are made of 1x2 material. On the side of each slat, as you will note in the tray for "Tuesday" shown in Figure 31, there is a batten nailed on each of the slats to act as a guide in pushing the trays into the sprouter. That prevents the trays from getting out of alignment and striking the posts when being put in place. The sprouting trays should be made of 1x3 material. The bottom of each of these trays is made of galvanized iron. The bottom of each tray is punctured full of holes with a 16 to 20 penny nail or some other tool that will make a hole about that size. You cannot get them too thick, for it is necessary that your trays drain well for best results. You will note that there is a tray for each day of the week. That makes the oldest of the oats being fed on the 6th or 7th day. The bottom tray should be

about 18 inches from the floor and a piece of tin or galvanized iron tacked permanently to the frame of the sprouter in such a way that it is lower in the center than on either edge or in either corner. Then you can simply take a sprinkling can and sprinkle the top tray of oats once each day. Put sufficient water on the top tray so that the water will drip or run through into the tray beneath it and into the bucket or pan which should be placed on the floor below. The oats in each tray should be stirred up by hand once each day till they have well started to sprout. Each day they should be spread out level over the tray. This causes them to sprout even and helps prevent molding. The trays should be built about 30 inches square, or if you have only a small number of hens you can build a smaller sprouter or regulate the size of your sprouter acording to your individual needs. It makes the trays inconvenient to handle if they are larger than 30 inches square. The slats should be so nailed that the trays, when in position, will be about 6 inches apart. If the sprouters can be used in an incubator room, cellar or some other room with a concrete floor, it is not necessary to be so particular about spilling water.

We have seen but few sprouters when lamps were used and when the sprouters were enclosed in which the oats did not mold more or less. Some of the incubator and supply companies are now manufacturing very good enclosed, heated sprouters. If you should have any trouble with the oats molding in such a sprouter, would advise you to take the question up directly with the manufacturer. If you can purchase fine mesh hardware cloth, it is even better for the bottom of the trays than galvanized iron. If the mesh in the wire is too large, the oats may waste through same.

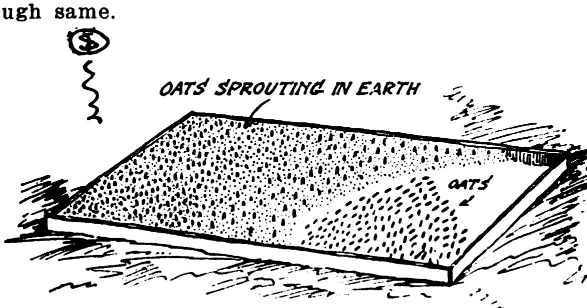


Fig. 32.

Figure 32 is an outdoor method of sprouting oats. In spring, summer and fall, some city lot poultry raisers prefer this method to the use of the sprouting rack. Make a frame of 1x6 lumber, 3 feet wide and 8 feet long, or longer if required. Cover the frame with poultry netting. Place the frame on the smooth hard ground. Take one bushel of oats and soak them over night, then spread them out evenly inside the frame work. Cover the oats with one inch of loose earth and water them every day. When the sprouts show through, it is ready to feed. Then with a garden hoe, work under the roots, pull them up straight, and you have as fine green food as you ever saw. It is hard to get food that the birds relish any more or that is cheaper or easier to obtain. Each shovelful has a big lump of dirt on it, also some animal food. You will usually find some bugs and worms along with the oats and earth. This gives the fowls exercise in scratching them out. Green food grown in earth has more strength and substance than when it is sprouted in water in a warm room.

You can keep a number of these beds going at all times if your flock is large enough to require same. Or, if you do not wish to use these frames in this way you can place one of the frames in the center of each poultry yard. Sow oats or rape rather thick, much thicker than would be done in case the oats were sown by the average farmer. Then cover them with about one inch of dirt and when the sprouts begin to come up through the dirt and through the wire, the birds will begin to eat same, but they cannot destroy the roots and the rape or oats keep growing because the roots and stem are protected by the wire covering.

FOUNTAINS AND WATERING DEVICES

A good many drinking fountains have been placed on the market, made of different materials. Some are good and many are of no value. One of the qualifications of a good fountain is that it should be so constructed as to permit its being easily cleaned, where the birds have easy access to the water and at the same time protect the fountain from filth and the sun. The kind that cannot be taken to pieces and all parts washed thoroughly is not adapted to use for fowls. Many diseases are spread by the drinking water, and we would not recommend any fountain that is not so constructed that it can be easily and thoroughly cleaned. A plain, open, simple and inexpensive galvanized or granite pan is one of the simplest and best drinking devices which can be used, providing you arrange it and protect it so that it cannot be easily overturned by the birds and so the birds cannot get into it with their feet.

Considerable labor is required in watering a large flock, especially if the water must be carried any distance. In order to make any profit on a large poultry farm, you must figure out a method and system so that a volume of business can be done, a good sized flock raised and kept at the least possible cost for labor or other expense. Therefore, it will pay you to look well to your watering devices and to the installation of a water system.

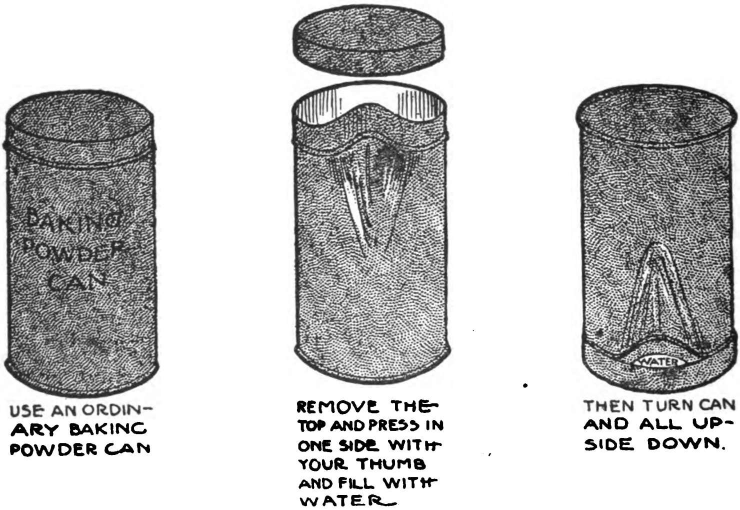


Fig. 33.

Figure 33 shows a drinking fountain for baby chicks that can be made from an ordinary baking powder can. For the use of baby chicks, a fountain must be so made that they cannot get into it and get themselves wet. This particular fountain is made by first washing or removing the label from the can, remove the top and then press in on one side with your thumb as shown in the illustration. This place that is pressed in with your thumb makes an opening from which the chicks can drink when the can is filled and inverted. The can may now be filled with fresh water, place the top on and then turn it upside down. The water will flow into the opening in front. The water will not waste and spill out in the coop or brooder, neither can the chicks get into it. The litter and filth will not get into the water as much as if you had an open and unprotected pan. This device is intended only for very small flocks of baby chicks.

Figure 34. This is a home-made drinking fountain that can be made at any hardware store or tin shop. The bottom of the fountain is simply a round tin pan. These should be two or three inches in depth, depending upon the age of the chicks. The can or fountain part is made round and just large enough so there will be one-half to an inch space between the fountain and the pan. About three holes the size of a lead pencil are made in the can or fountain about an inch from the bottom. This permits the water to flow out of the can into the open space of the pan just as it is consumed by the birds. In order to fill the fountain, the can is turned bottom side up and then filled with water. The pan is placed over it and then the entire fountain and contents are suddenly inverted to the position shown in the illustration. A handle may be soldered on the top of the can for convenience in carrying and refilling. You may also have a circular piece of galvanized iron soldered around the fountain as shown in the illustration. This protects the water from filth or from droppings in case a bird should light on top of the fountain. This fountain is especially valuable for young chicks or birds of most any age. It is one of the best ideas for a fountain that you can possibly use.

Fig. 34.

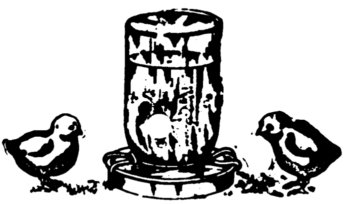


Fig. 35.

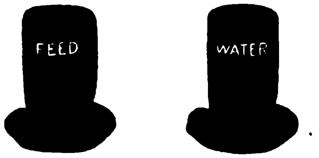


Fig. 36.

Figure 35 shows an automatic fountain and chick feeder made and sold by the Oaks Manufacturing Company of Tipton, Indiana. The bottom of the fountain is made so that an ordinary Mason jar fits into same. This appliance feeds water, grain, grit and charcoal automatically. It is very easy to fill and operate. Simply lift the trigger which releases the pan and the clip remains on the jar, leaving the pan without any obstruction and affords easy cleaning. This is absolutely sanitary and made to fit any pint, quart or half-gallon jar.

Fig. 36 illustrates a feed and watering device for baby chicks which is made by the Simplex Poultry Supply Company of Chicago. It is very similar to the above except instead of the pan below being almost entirely open, the pan is covered and the chicks eat or drink through holes in the cover. These little devices are especially advisable in feeding sour milk, butter-milk, water, charcoal and grit to baby chicks when first taken from the incubator and during the first week or ten days following that time. Every poultryman should have one or more filled with sour milk or butter-milk when starting the baby chicks and should also have one or more filled with powdered charcoal. Either of these devices will prove entirely satisfactory.

Figure 37. Where several hundred growing chicks are kept on free range in one flock, it is quite a task to keep them supplied with fresh water, and very often during the hot summer days their supply becomes exhausted and they suffer for want of water. If you have several hundred in one flock, it is advisable to get a large keg or small water barrel and put a faucet in the lower part of the barrel and turn the faucet just enough so that a little water will continue to run or drip continuously. The keg can be filled once a day, and you need not feel any uneasiness about your birds having a sufficient supply of fresh water. Place the keg in the shade of a tree where it will be convenient to the flock.

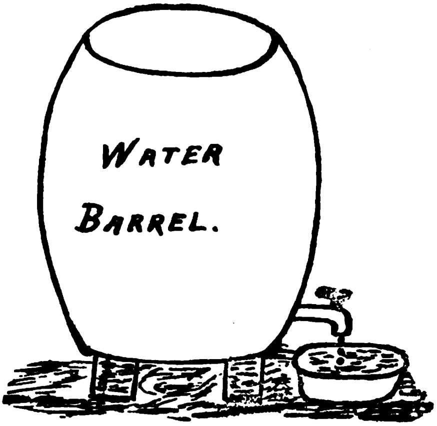


Fig. 37.

An open pan can be placed below the faucet to catch the surplus of water as it drips from the keg or barrel. Place a cover over the barrel and also protect the water in the pan from being fouled by the feet of the chickens if possible.

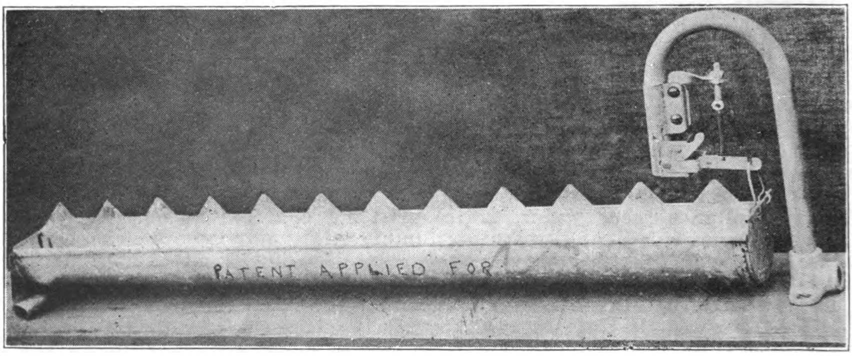


Fig. 38.

Figure 38 is an automatic baby chick fountain which has proven very satisfactory where large flocks of young chicks are kept in one house. The water must first be piped to the house and this fountain automatic cut-off can be attached to same so there will be a continuous flow of fresh water just as that in the drinking pan is consumed by the chicks. This automatic cut-off and fountains are made by John Imschweiler of Inglewood, Calif. The valve is made so that it will fit any standard ¼-inch

pipe fitting. The valve should come 3½ inches from the floor in order to fit the troughs which are made for same. Before attaching valve, wash out any dirt that may be in the water pipe. After valve is connected, hang the trough in the notch or arm which is supported by a brass spring. To regulate the desired water level, a nut on the screw that controls same may be changed to give more or less tension as required. It is also arranged so the water can be shut off entirely when the trough is removed for cleaning. When the water gets low in the trough the spring will lift the trough and it will refill automatically.

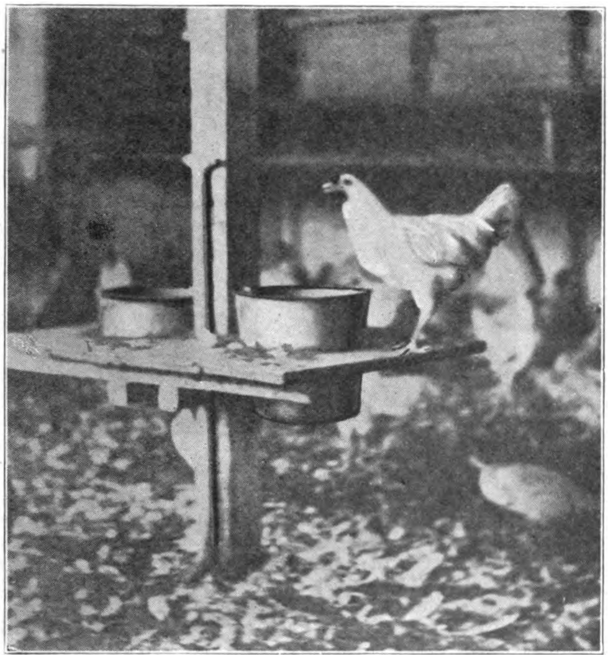


Fig. 39.

Figure 39 illustrates two drinking fountains on a platform which is placed about 2 feet from the floor of the poultry house. You will also note that the water is piped to the pans so all that is required is to simply turn the faucet and the pans may be easily refilled at any time. This avoids the labor and expense of carrying water long distances, which is quite an item in watering a large flock of chickens.

A large screw hook is straightened out so as to form a right angle. The screw end of the hook is screwed into the post and then when the pan is to be removed, the hook is simply turned with the point upward, which permits the pan to be taken from the platform. When it is cleaned and put back in place the point of the hook is simply turned down over the edge of the pan. This holds it always in place and prevents it being turned over by the chickens. If you have sufficient room on your platform for the chickens to stand, you will find that they seldom get into the water with their feet. The screw hook is screwed into the post just above the edge of the pan so that the pan fits snugly between the screw hook and the platform. This is a splendid, simple and inexpensive watering device which is suitable for use in the average poultry house.

On the right hand side of the platform nearest the hen is shown a water bucket, which fits into a circular opening that has been cut into the

platform. This permits the bucket to pass half way or more down through the opening, which holds it in position and prevents the fowls from turning same over. It also permits the bucket to be removed from the opening at will, so that same may be easily cleansed. If the bucket is kept practically full of water, the birds can easily reach same until the water passes considerably below the level of the platform.

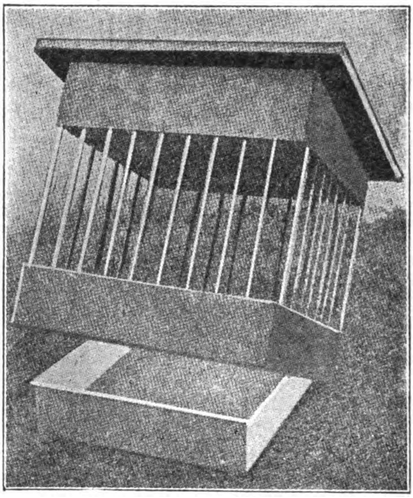


Fig. 40.

Figure 40 shows a plain square galvanized watering pan around which fits a protection made of wire and a cover for shade and protection made of light weight lumber and roofing material. This always insures clean and cool water and prevents the fowls from getting into the drinking pan at any time. The wires are placed just wide enough apart so that the chickens can drink freely from same. The cover can be easily raised so that the pan can be thoroughly cleaned or easily refilled. This is a splendid device for watering fowls where growing stock or laying hens are kept out on range.

The size of your pans depend upon the size of the flock for which they are intended. The frame of the cover should be about an inch larger on either side than the pan that is to be covered. A large, plain galvanized pan, such as shown here, is one of the most durable and satisfactory watering devices that can be used for growing stock or large flocks. Keep them in the shade and protect them as much as possible from the feet of the birds. We have used these large pans without a covering with very good success.

Figure 41 represents an automatic air lock fountain made by the Norwich Automatic Feeder Company of New London, Conn. We have used this fountain with considerable success in winter months. It has been a problem for years to supply water to the poultry house when the temperature goes below freezing and to know that the fowls have access to drinking water at any time. In some sections, the temperature goes so low in winter that you scarcely fill and get away from the drinking fountain before it is covered with ice, and, therefore, the hens suffer from lack of water in winter. Various devices have been on the market, and most of them have been failures. This fountain has proven itself to be sanitary, easily cleaned, top filled and non-freezing.

In order to clean the slime which accumulates on the inside of most fountains, it is a good idea once a month to put a solution of caustic soda

and water in the reservoir and rinse it. Then the inside of the vessel will be found perfectly clean and bright.

The egg is composed largely of water. If you permit the water to remain frozen very much of the time in winter, you can expect your winter egg yield to be greatly reduced.

Fig. 41.

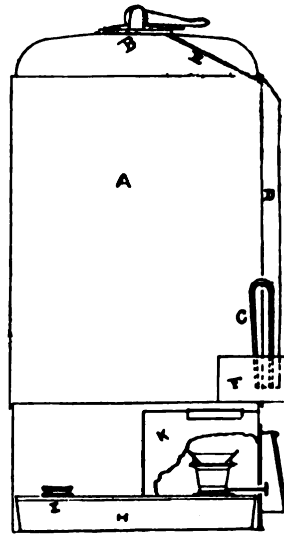


Fig. 42.

Figure 42. The above fountain consists of a Reservoir A, which is top-filled through the opening B, and is made air-tight by a rubber gasket fitting under an absolutely positive eccentric acting cap. Attached to and extending into the resorvoir is a copper siphon pipe, C, the outer leg if which extends on the outside of the reservoir downward to the detachable cast iron drinking cup, F, passing inside the square air pipe, D.

It will be observed that there is no connection between the Drinking Cup and the Reservoir, except through the syphon pipe, and as its action is always downward and outward, contamination of the water supply is not probable. If for any reason the water within the drinking cup becomes polluted, it is a simple matter to close the plug valve of the syphon pipe, remove and rinse out the cup, snap it back in position, open the valve, and a new and fresh supply of water is delivered automatically from the reservoir to the cup.

A most important part of this fountain is the heating device. Quite naturally, there are but two methods of preventing freezing in water vessels; one is to supply heat by burning fuel, the other by the employment of the so-called thermos or vacuum system. The latter system is so expensive that it is impracticable to apply it to a poultry fountain, so the only course left open is the application of heat produced by fuel. The removable oil chamber, H, holds approximately three pints of kerosene, and is filled through the screw cap, I. The burner is surrounded by the removable Heat Generator, K, so the flame cannot be extinguished either by draughts or the flapping of the birds' wings. This Heat Generator holds the heated air from the burner until it is really super-heated, when it passes through the series of holes of the base as shown in photographic cut, and the heated air, passing up and around the reservoir, will positively keep the apparatus from freezing. The machine has been tested to a temperature of twenty degrees below zero, and the system works perfectly.

Figure 43 is a sanitary drinking fountain that can be used on the floor of any poultry house. You will note that a bread pan or a large sized galvanized pan may be made and slipped beneath the hardware cloth on which rests the fountain. Any water which is spilled is caught by the pan below and the floor is kept perfectly dry. The frame is made 24 inches wide and 32 inches long. The hardware cloth is tacked on each side so that it fits snugly over the pan when the pan is shoved into place. The fountain is then placed on the hardware cloth and the pan below catches any overflow.

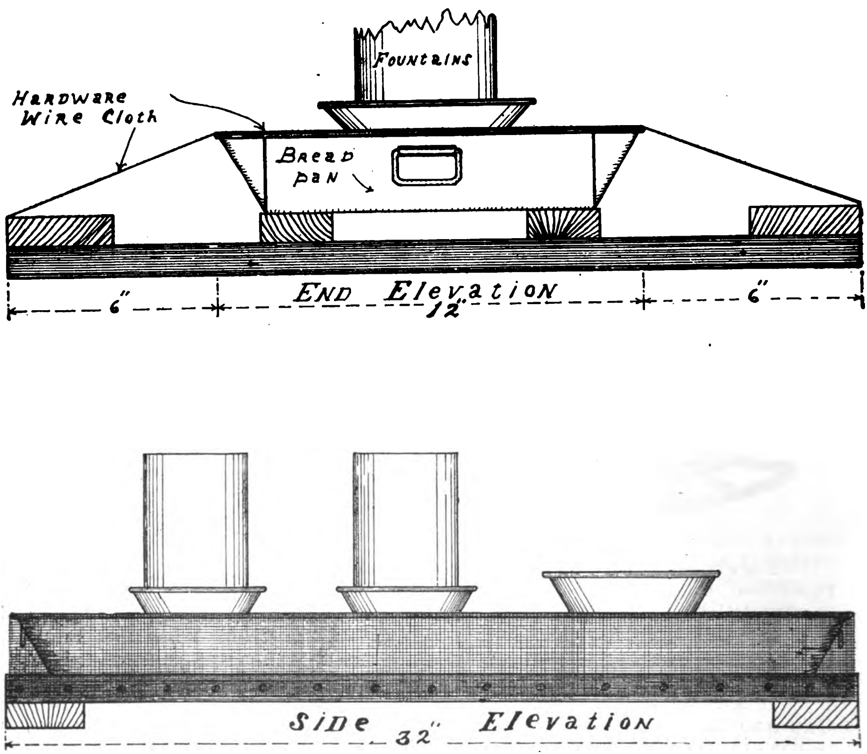


Fig. 43.

This is also a good watering vessel for ducks. Ducks require a fountain deep enough so that they can get their beaks, nostrils and eyes into the water or else sore eyes, and in some cases, death result. Ducks also slop and waste more or less water, and this method of watering ducks has proven quite useful in some cases, especially so when they are being kept in a brooder or house and you wish to keep the floor dry. If you wish to use this system as an outdoor proposition, a trench can be dug in the earth about 18 inches deep. A light frame can be made to fit the outside of this trench and the frame covered with hardware cloth. Then the fountain may be placed on this the same as shown above. In that case any water that is slopped out of the fountain passes into the trench below and drains away.

Figure 44 represents an automatic poultry fountain which has proven to be very popular where you wish to pipe the water to your poultry house. Many of them are in use on some of the most successful poultry farms and it has been found to be quite a labor saving device. If the water can be piped to your houses and yards, these fountains can be easily attached with an ordinary pipe wrench. In installing a large poul-

try farm, it is a good idea to give some attention to labor saving devices and the immense amount of time and labor required in lugging water to large flocks. This fountain insures a constant watering supply and does away with the usual mud puddle. This funnel shaped fountain is 12 inches in diameter at the top and 4 inches from the bottom to top of

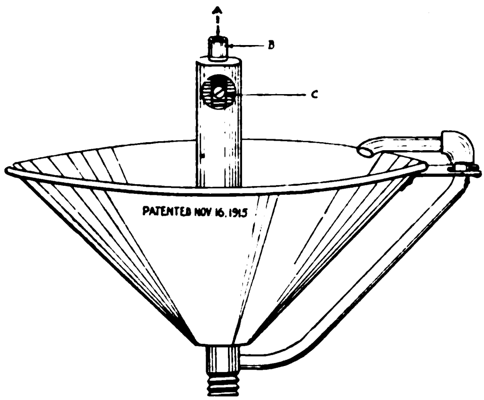


Fig. 44.

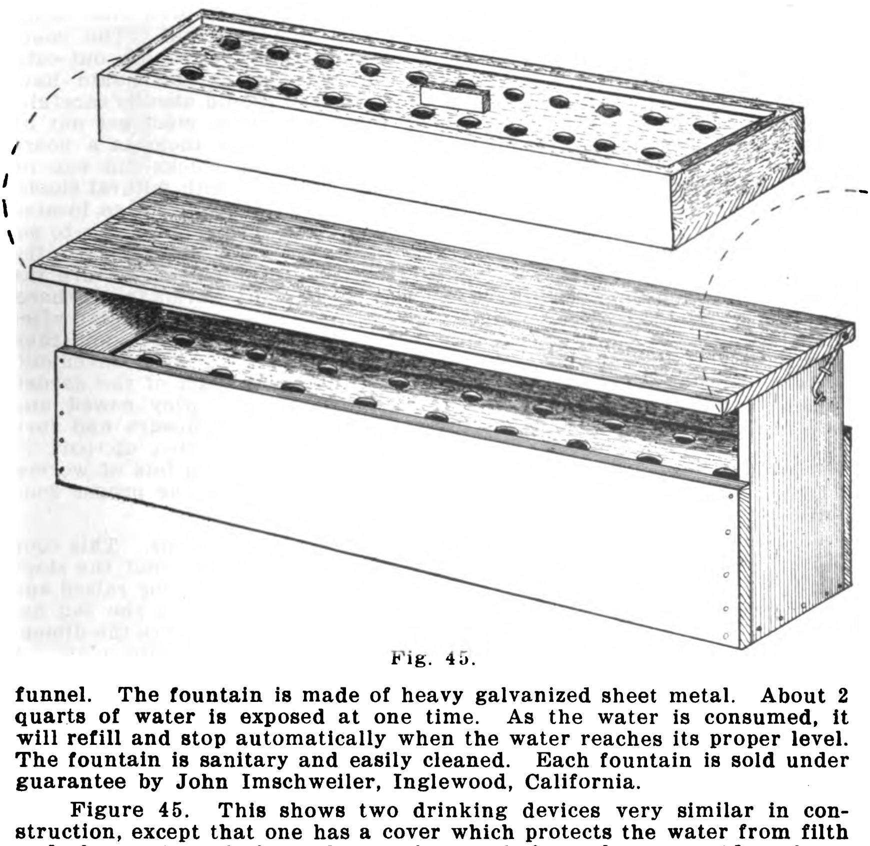


Fig. 45.

funnel. The fountain is made of heavy galvanized sheet metal. About 2 quarts of water is exposed at one time. As the water is consumed, it will refill and stop automatically when the water reaches its proper level. The fountain is sanitary and easily cleaned. Each fountain is sold under guarantee by John Imschweiler, Inglewood, California.

Figure 45. This shows two drinking devices very similar in construction, except that one has a cover which protects the water from filth and also protects it from the sun in case it is used as an outdoor foun-

tain. A pan that can be easily cleaned should be used for this purpose. On the interior of this pan sets a wooden float with half inch holes bored in same. The float is about one inch smaller each way than the pan so that it may be easily lifted and not catch on the side of the drinking vessel. The wooden float should be made of cedar. This float is used and recommended because it protects the wattles of the fowl from the water and thus helps to keep them from freezing in cold weather. A wooden trough should not be used for the reason that it is not as sanitary as metal. It would be necessary for the drinking vessel to have sides that were straight up and down so that the float would pass down with the water. The cover for the lower fountain swings out of the way on hinges made by bending No. 10 wire until it forms an eye at one end and a hook at the other. Ten penny nails are then driven through this eye into the cover and staples are put over the shank of the wire to hold it rigid. You will see that this allows the cover to turn over and out of the way. The wire "Eye" end is extended over the sides of the upright which causes the cover to stand up in an upright position of its own accord. The wire hinge extends out over the rear of the trough end about three-fourths of an inch so that it gives the cover an opportunity to swing, which could not otherwise be done, to the projecting edges of the cover. Ordinary T hinges could be used, perhaps more satisfactorily.

BROOD COOPS

Chicks hatched by the natural method should be reared in brood coops out of doors. The hen should be confined to the coop until the chicks are about weaned, but the chicks should be allowed free range during good weather, and after they are a few days old. The coops should be made so they can be closed at night in order to keep out cats, rats and other poultry enemies, but the hen and chicks should have plenty of fresh air. Shade and fresh, moist earth should also be carefully considered. In order for chicks to do their best, they must get out on the ground, but hard sun-baked ground is as bad for them as a board floor. The brood coop should be located where the chicks can run on sod or soft earth. If the poultry yard is not provided with natural shade, then see that artificial shade is provided. If your yards are so located that the chicks have to run on bare ground, then it is a good plan to secure several strips of sod, lay in the yard where you have spaded the ground well, and moisten with water. Each morning and night turn the sod back and the chicks will have a feast off the many worms found there. The coops should be moved often, as the earth becomes contaminated after a little while. If you will spade the earth where the coop was, and then sow some grain it will soon be in good condition again. If it is convenient, it is well to run a two-foot high wire netting across part of the garden which has been plowed and some wheat, oats and barley sowed and covered with cultivator. Place brood coops in this enclosure and turn the little chicks in. Each morning at feeding time turn up part of the ground with a spade exposing the sprouted grain and lots of worms. This provides fresh, sweet ground, lots of exercise and the proper food for the chicks.

Figure 46 is a plan of coop for rearing chicks with hens. This coop can be made by sawing a dry goods box so as to give the roof the slope shown in the illustration. The cover is made so that it can be raised and have access to the interior. If you can not secure the boxes you can use lumber which can be bought for the purpose. The figure gives the dimensions so that there is no necessity of discussing that part of the plan. A door is made in front that can be let down so that the hen will have access to the run in front. The run should be made of slats, which are better than poultry wire. A run four feet long will answer practically every pnrpose. Such a coop will easily pay for itself in a season. A floor is put in the coop to keep rats from burrowing underneath and to make it more sanitary for the chicks and protect them from water in case of a heavy rain. The sides of the coop should be made of tongue and grooved lumber. The sheeting and frame can be a very cheap grade of lumber. Cover the roof with composition roofing.

Figure 47 is one of the above coops in use. You will note an open space in the top of the coop which is covered with wire and admits ventilation at all times, yet the roof board in front prevents rain from beating into the coop. You will also note that the runway in front is built almost entirely of laths or light weight strips. You will also notice a door in the

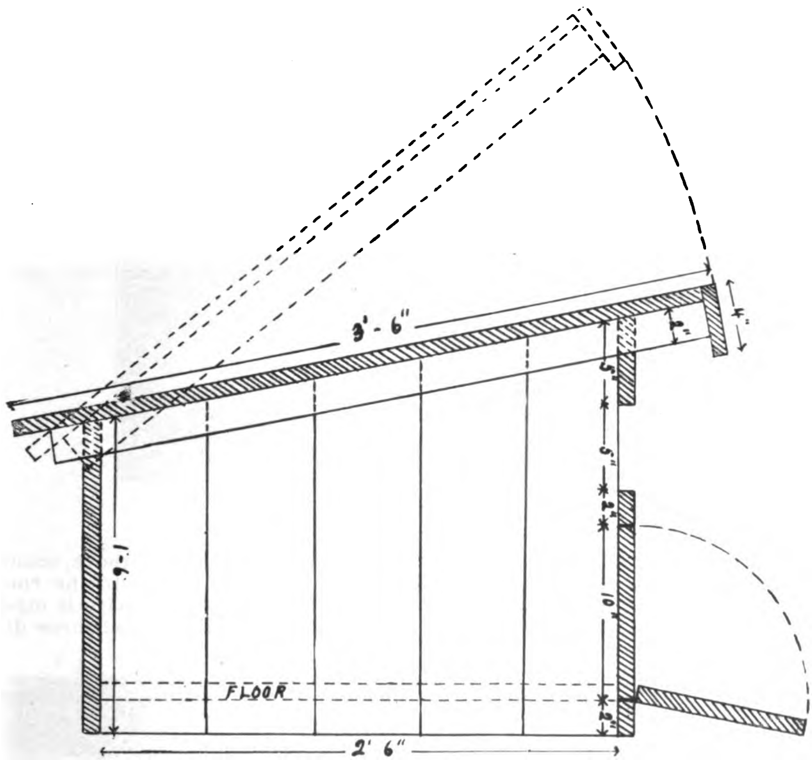


Fig. 46.

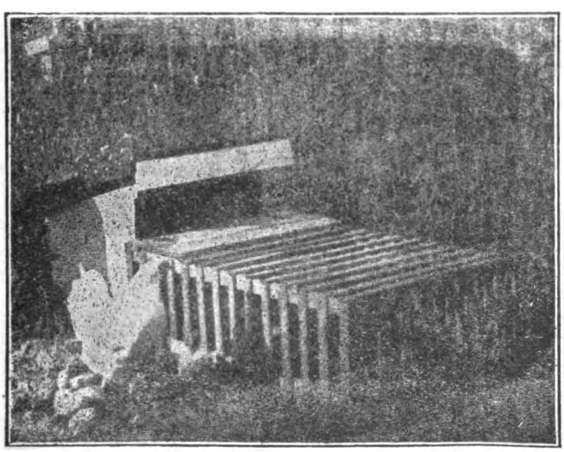


Fig. 47.

top of the runway nearest the coop. This is placed at that point so that it can be easily lifted and the front door of the coop opened and closed or the chicks fed without having to take the runway from the coop. This method of raising chicks with hens has been one of the best coops, runways and systems we have ever used for natural brooding.

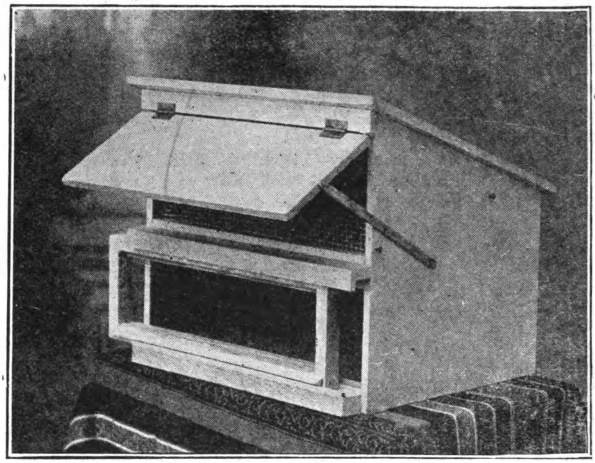


Fig. 48.

Figure 48 is practically the same coop as that illustrated above, except that the ventilating board is hinged instead of being nailed to the roof. You will also note that the front door which is covered with wire is made so that it slides in and out of the coop. This opening really has three dif-

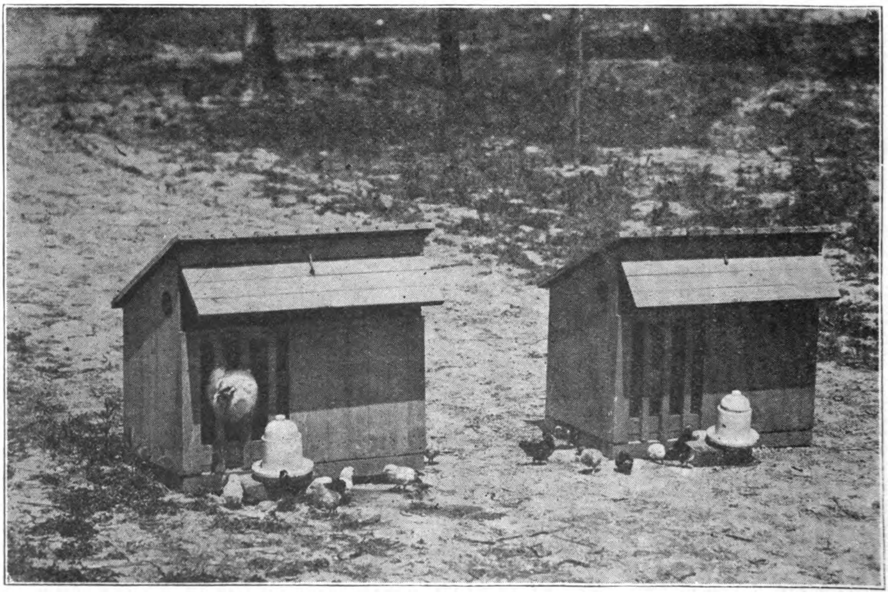


Fig. 49.

ferent doors. One door is covered with wire, which confines the hen and chickens to the coop. A second and sliding door, which fits the same opening, is covered with lath nailed up and down and placed just wide enough apart to permit the chicks to pass in and out and yet keep the hen confined to the house; the third door is a solid board of the same size, which is used when necessary.

Figure 49 shows a coop that is used on the Government poultry farm. There is a wire door back of the boarded front of this coop which can be slid forward. This arrangement furnishes the hen and chicks plenty of ventilation and fresh air at night and prevents any animals from entering the coop. There is additional ventilation in the front near the top of the coop as this board can be hinged and raised upward as shown in the illustration. You will note the small rounding ventilating holes on the sides of the coops. With this amount of ventilation the hen will be reasonably comfortable in the coop even on a hot day. It is best, however, to keep these coops in the shade when the weather is extremely hot. Most brood coops should be built about two and one-half feet square, or, perhaps, two feet across the front and two and one-half feet deep.

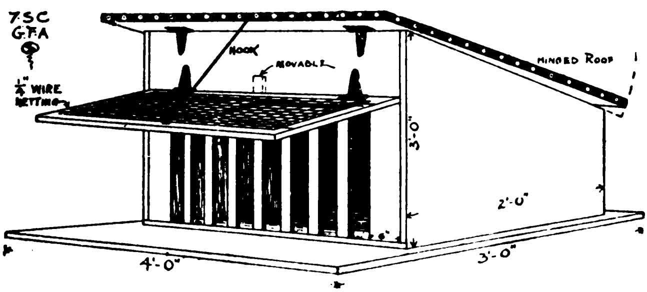


Fig. 50.

Figure 50 illustrates a coop that is very similar in design to some of those mentioned above. These coops greatly simplify methods of raising chicks because they are convenient and easily cleaned. All of these coops should be made so that the chicks can be confined at night or other times when necessary and still have sufficient ventilation. They should be made large enough to shelter the chicks when you have a cold, wet season of weather. This coop which is illustrated above is built with a floor which is three feet wide and four feet long. The coop, therefore, can be lifted from the floor and the same easily cleaned. We prefer to have the floor set inside the coop and at the same time be removable, for in that case the rain could not enter between the floor and the sides of the coop. The roof is hinged at the front which is really better than hinging the doors in the rear.

The front of the coop is practically one-half wood and one-half wire. The door is covered with small mesh wire or hardware cloth. The door can be held in place with a heavy wire hook made from smooth fencing wire or clothes line wire. The frame is built of 2x2's and the sides are made from matched lumber. This particular coop is three feet long, two feet and six inches wide, two feet and six inches high in front and eighteen inches high in the rear. The roof is made of matched lumber and covered with composition roofing. In order to construct the coop so that it may be easily cleaned from the top it is usually best to nail cleats on the interior of the roof so that they will fit snugly inside of the box, then fasten the roof to the coop proper with ordinary hooks and eyes.

Figure 51 is a brood coop with a small run in front for the hen. The coop proper is the same thing as illustrated above in figure 49, and you will note the wire door that slides in back of the wooden front and the slats for use at night. You will also note that a lath runway has been

built so that the chicks can pass back and forth at will. A burlap sack acts as a covering for the top and protects the hen from the sun and rain. You will see a number of these coops scattered through a field

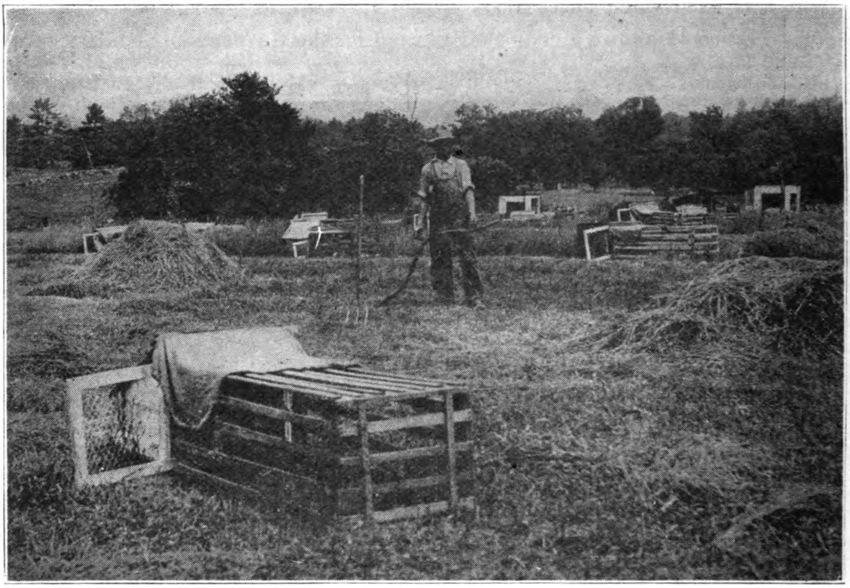


Fig. 51.

of grain. By using the coops in this manner they can be moved about the farm from place to place and it gives the hen and chicks access to fresh ground and also gives them an opportunity to consume a lot of bugs and worms.

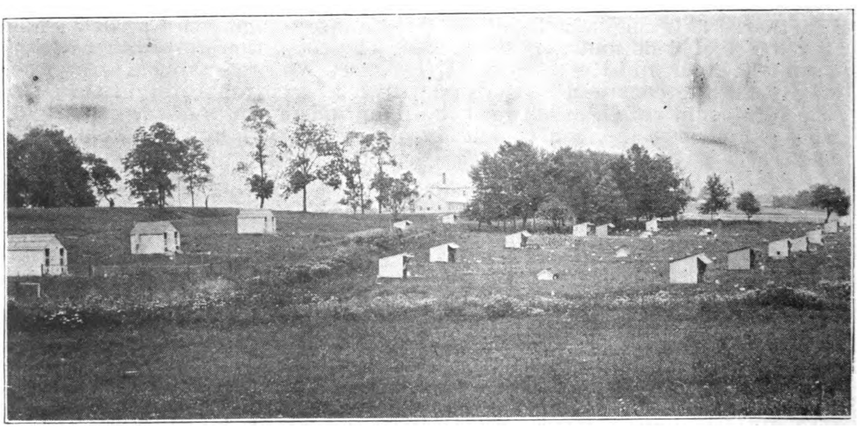


Fig. 52.

Figure 52 are small coops and colony houses being used in a field of clover. These coops are built about 6x8 or 8x10 feet and the chickens

are sorted according to age and put out on the range. In these coops you will note the large hoppers. In the center, between the rows of coops shown on the right, are the hoppers which contain grain on one side and mash on the other. The coops are usually raised high enough from the ground so that the chickens can get underneath and thus protect themselves from the sun. Most any sort of coop or colony house, such as we have illustrated in various portions of our lessons, may be used for growing stock.

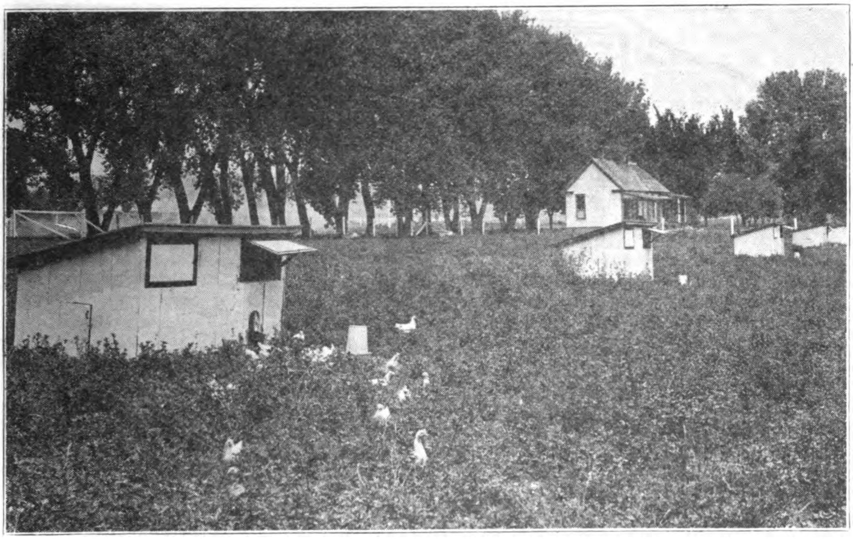


Fig. 53.

Figure 53 represents a coop or colony house that is about 4 feet wide, 6 feet long, about 4 feet high in front and 3 feet high in the rear. You will note that these coops are being used in alfalfa fields. The roof can be made separate from the coop and cleats nailed from the interior so as to hold it in place. The roof can be fastened to the body of the coop with ordinary hooks and eyes. This permits the top to be lifted and shoved to one side so the coop can be easily cleaned. The roof also can be removed, which lightens the coop when being moved from place to place.

You will note two openings in front for ventilation. These are covered with one-inch poultry netting and also with a burlap curtain. These are hinged at the top so they can be raised and lowered as the weather requires. A notch is cut into the side of the burlap covered frames into which is inverted a small strip fastened to the frame of the window with a screw. This strip is notched every two inches. A small opening is cut into the edge of the one-inch mesh wire and a nail is driven into the side of the opening. This permits opening the burlap covered frame two inches or more at a time. A small doorway is cut in each end of the coop to make it possible to care for a hover and lamp should one use portable hovers for brooding.

The floor is laid on 2x4 runners, each runner being 7 feet long. It is permitted to protrude one inch outside the floor on both the front and back and six inches at each end. The floor is independent from the rest of the house, which sets down over the floor and rests on the 2x4 proper. The house proper can be laid over backwards or lifted off entirely to permit thorough cleaning and scrubbing. Holes are bored through the ends

of the 2x4 to permit placing a chain and clevices so that the coop can be moved about from place to place. One horse is sufficient for moving these coops.

A door, the full height of the front, the width of two 12-inch boards, is placed directly between the two windows or ventilator openings. A screen door hook is placed on the lower edge of this for hooking the door back permanently. Should it be left open during the day time, it is necessary to keep one burlap covered frame closed.

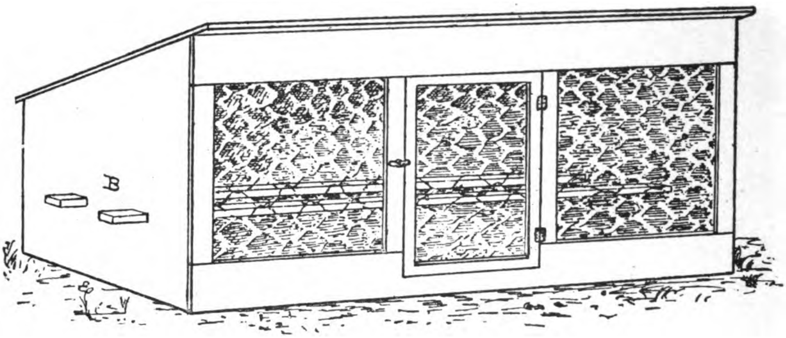


Fig. 54.

Figure 54 illustrates a coop that is 6 feet in length and 2 feet 6 inches in width. It is 2 feet 4 inches high in front and 18 inches high in the rear. You will note that there is a door in the center of the front and that almost the entire front with the exception of a 6-inch board at the top and bottom is covered with 1-inch poultry netting. You can also see

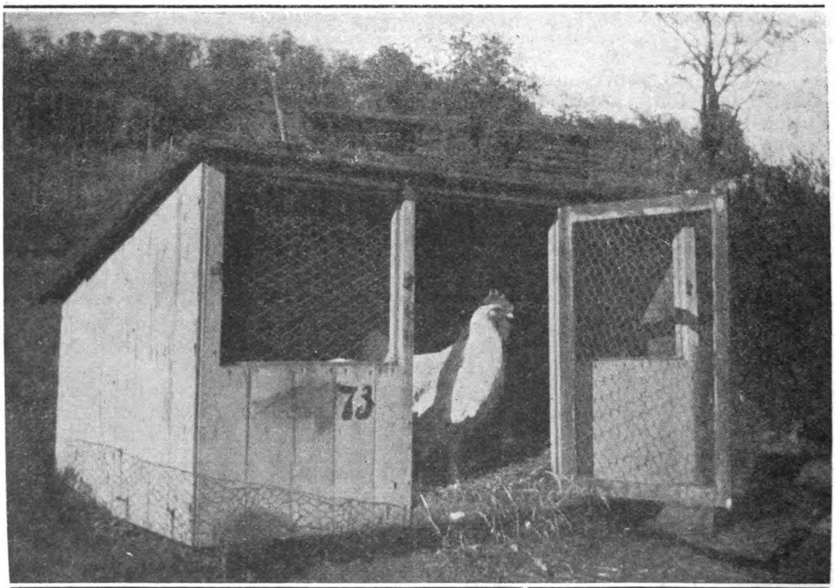


Fig. 55.

two roost poles that pass through the center of the coops. While these coops are rather small, yet they are conveniently handled and economically constructed and will accommodate quite a flock of growing chicks.

Board floors may be made just large enough to fit the inside of the coop so the edges of the coop will fit down on the floor. If there is no danger of any animals of any sort disturbing the chicks, then the floor may be dispensed with and the coop moved to fresh ground every few days. One of the roost poles may be removed and this coop used on a nice grassy lawn for males or females that are being conditioned and gotten ready for fall fairs and shows, or where you wish to keep them separated from the general flock.

Figure 55. This shows a coop very similar in construction to that illustrated in Figure 54. The coop is a trifle larger in size and can be used for a half dozen hens and a male bird that are being kept on a city lot, or it makes a splendid colony house for small flocks of growing chicks.

The coop is small enough so that it may be picked up by three or four men and carried to a new spot of ground without the necessity of having a team with which to move same.

NESTS

Nests in a poultry house are, in many cases, the beginning point of very serious trouble and a great loss. If the nests are so built that they cannot be easily kept clean, they are one of the best places on the farm for the breeding of lice and mites. Mites nearly always gain their first start in the nests and from there spread to the roosts, poles, cracks and crevices to prey upon the bodies of the birds. Also, the arrangement of the nests is often responsible for dirty and broken eggs. The location of the nests also determine, as a rule, the number of the hens in the flock that develop the habit of eating eggs. Never leave a broken egg in the nest, nor a rotten egg. Mites develop rapidly amid such surroundings.

If you use open nests, you should have one or more nests to every six hens during the heavy laying season. If you use trap-nests, provide one or more traps for every three hens.

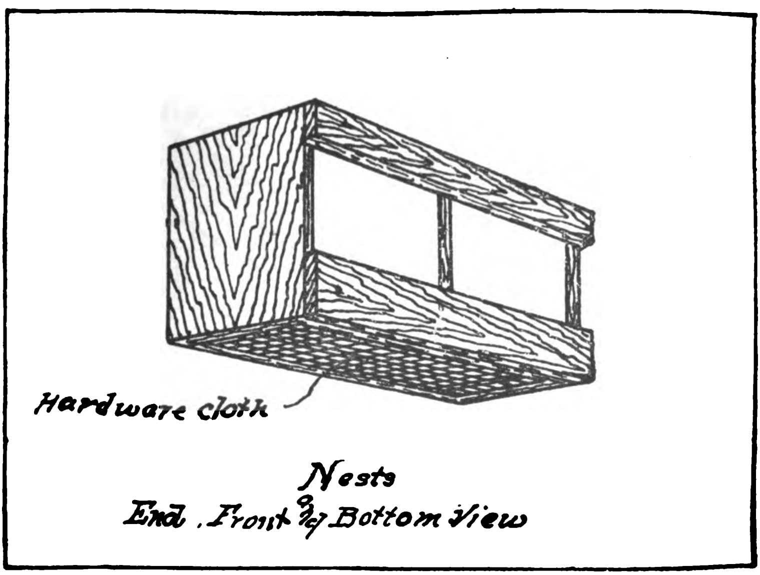


Fig. 56.

Figure 56 represents one section of a very plain, yet very satisfactory nest. You will note that the bottom of the nest is covered with hardware cloth. This should be a fine mesh so as to prevent the straw or nesting material from wasting through same. The top of the nest is covered with ordinary poultry netting. You will notice that the nests are built in pairs. This makes the nests light so they can be easily removed or put in place after being cleaned.

The size of each nest should be about 12 or 14 inches square, depending upon the size of birds that compose your flock. Or you can build the nests so that they are about 12 inches wide and 14 inches deep and about 15 inches in height.

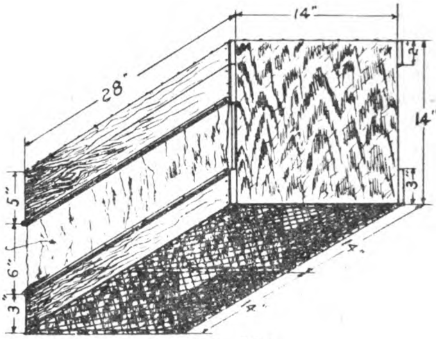


Fig. 56A

Fig. 56A shows the end, back and bottom of the sectional nests. Hardware cloth covers the bottom. The opening in the rear can be covered with muslin, burlap or cloth, or a board may be made to fit this space and hinged so it can be opened and closed when gathering eggs or looking after hens on the nests. The top may also be closed with hardware cloth if found necessary.

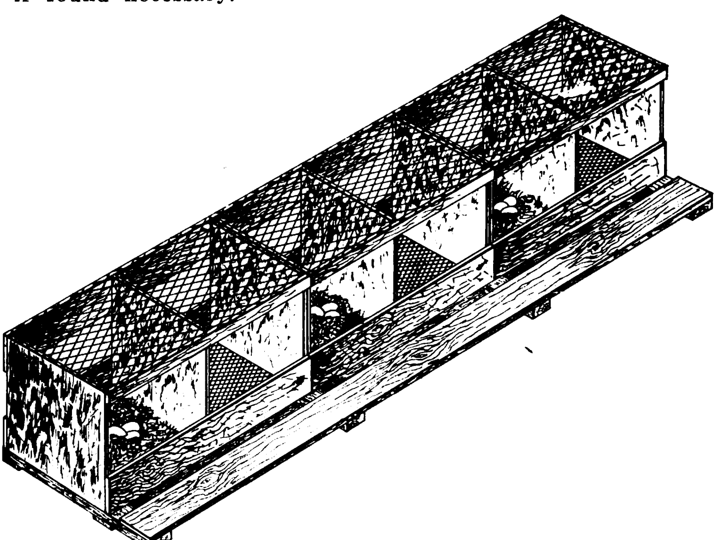


Fig. 57.

Fig. 57.—Nests, three sections of 2 nests each, showing end, front and top view.

Figure 57 shows three sections of the nest illustrated above, placed on the frame that supports same. This framing material is attached to

each side of the house and supported at the ends and in the center so as to hold the frame in place beneath the droppings board. The front portion of the nests, showing the 1x4-inch runway in front of the nests, is really the portion of the nest that faces the wall when the nests are placed beneath the droppings board. The hens, therefore, pass underneath the nests and are then permitted to fly upon the runway where they then pass to any nest that they may choose. In the evening when a poultryman wishes to gather the eggs, there is a hinged door on the opposite side made of 1x6 board, which is hinged upward so the board may be raised and the eggs gathered, after which the board falls back into place and protects the nests from the light. The frame work which supports the nests are made more or less stationary, but the sections or pairs of nests simply rest on the frame and can be removed at will.

Figure 58 illustrates a wall nest that can be attached to the wall of any poultry house. We usually think it best to make the frame which supports the nest more or less stationary, but always have the nest proper built separately so it can simply be placed on the frame work and then removed when necessary to clean, disinfect or paint same. You will notice that the lid is built in two parts so that the lower section may be raised when the eggs are to be gathered. There should be a platform at the end of the nests so the hens could fly up on same and could then pass through a passage way which permits them to go from nest to nest. The end of the nests is closed with a sliding door which may be closed or left open, as desired. The partitions are 14 inches apart. The front board works in between cleats nailed at each end so it may be easily lifted and

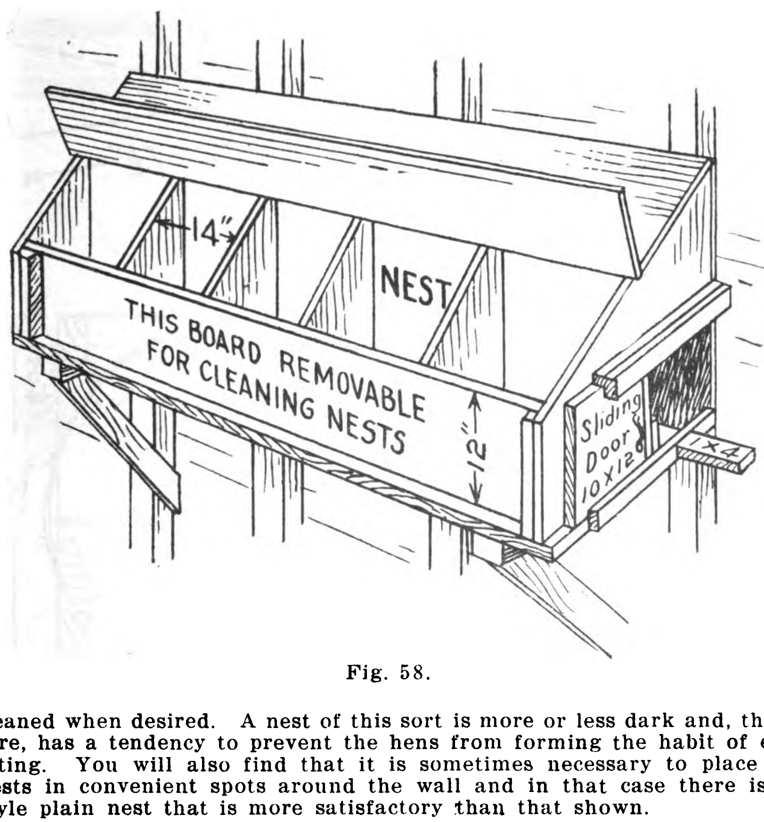


Fig. 58.

cleaned when desired. A nest of this sort is more or less dark and, therefore, has a tendency to prevent the hens from forming the habit of egg-eating. You will also find that it is sometimes necessary to place the nests in convenient spots around the wall and in that case there is no style plain nest that is more satisfactory than that shown.

TRAP-NESTS

Year by year the trap-nest is coming to be more fully appreciated and more of a necessity to the poultry raisers who are striving for higher egg production in their flocks. The trap-nest enables the poultrymen to know just which of his hens are the drones and which fill the egg basket, and gives him the opportunity of breeding only from the hens that make good records as layers, thus producing offsprings with better laying qualities than the average of his present flock. The trap-nest enables you to tell which hens lay most, which lay small eggs, thin-shelled eggs, eggs which hatch and eggs which do not hatch, hens that produce weak chicks, those that die in the shell and various other things that every poultryman should know about his breeding stock. It is not necessary to trap-nest your entire flock, but any man who expects to succeed in breeding poultry should select at least a few of his choicest specimens and trap-nest them during the winter and breeding season. The remainder of the year he can permit them to lay in open nests. Poultrymen who practice this method will make far more rapid progress than will the man who breeds promiscuously.

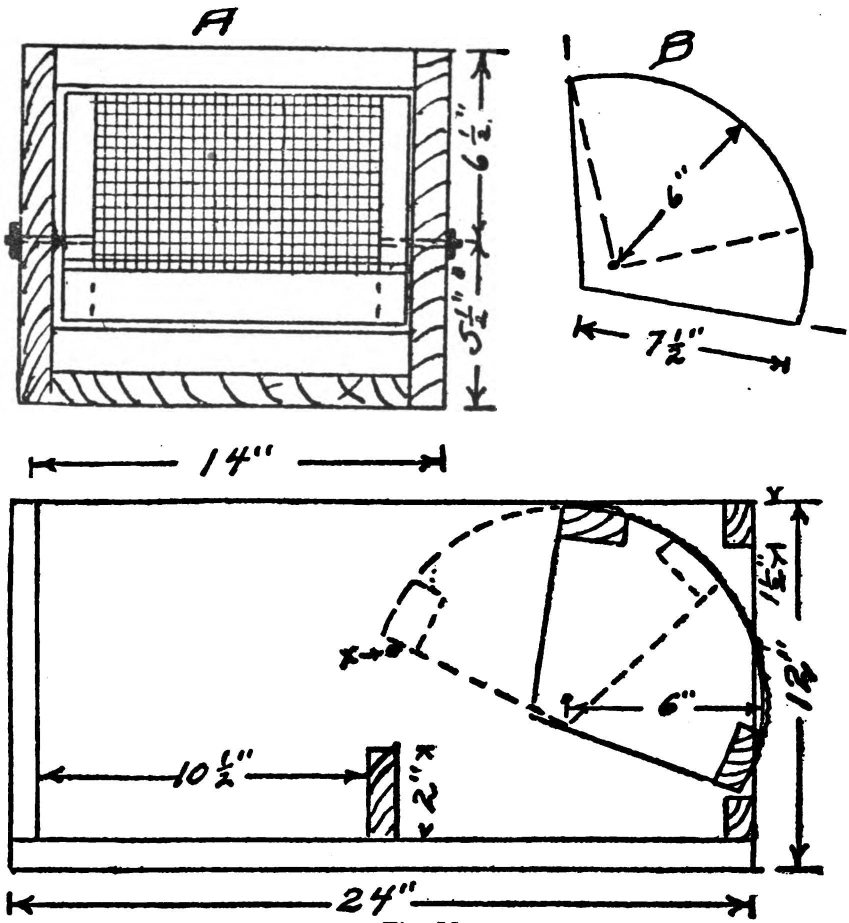
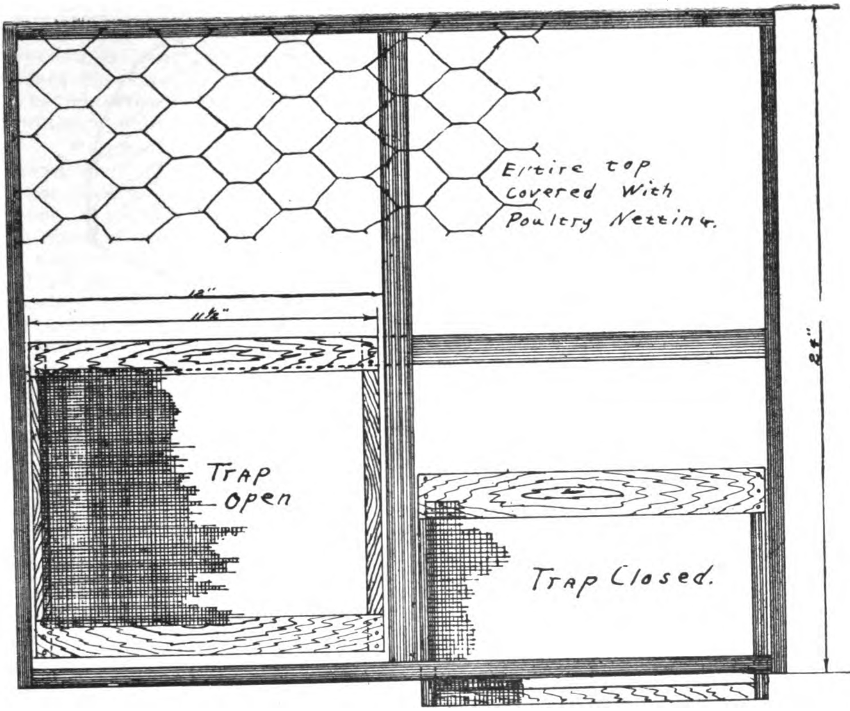
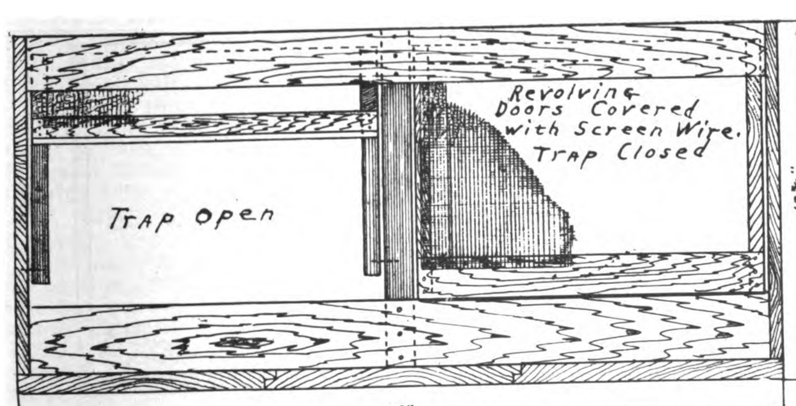


Fig. 59.

One trap-nest should be provided for every three or four hens kept in the flock. The hens are banded with bands which are numbered and a

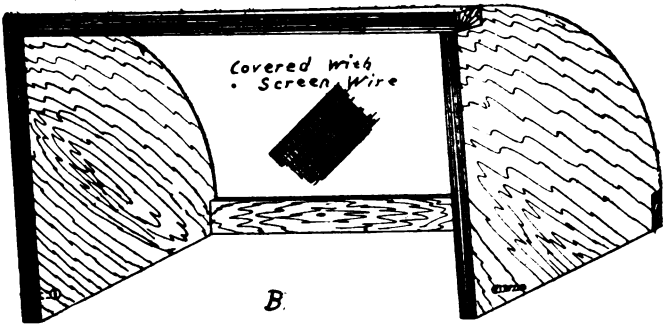


TOP VIEW.
PLAN A.



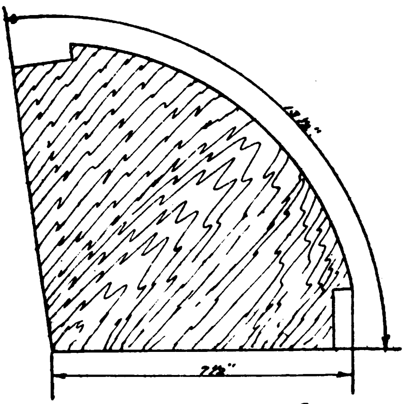
FRONT ELEVATION D.

Fig. 60.

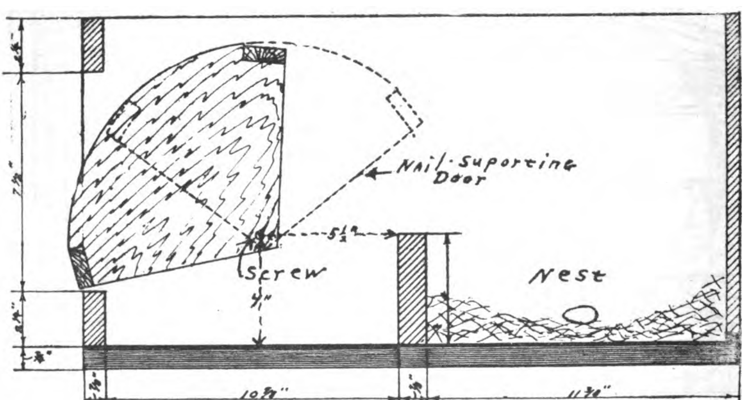


B.

Isometric View
Of Door



Detail of Trap Side C.



Side Elevation E.

Fig. 61.

record is kept of their egg production. The nests should be visited at least three times a day, and in extremely hot weather, they should be visited oftener. Trap-nests may be placed along the wall of a poultry house or beneath the droppings board.

Figure 59 represents the most satisfactory and simple nest that we have ever used, and we have trap-nested thousands of hens during the past several years. There are no triggers or complicated parts about this nest to get out of condition. It is a simple, home-made contrivance. It is easy to make and positive in its operation. It consists essentially of a box with the top and one end removed. The box is 24 inches long, 12 or 14 inches wide, and 12 inches high. The top of the box or nest is covered with poultry netting. The open end is closed by a revolving door which is covered with hardware cloth or with ordinary screen wire. Care must be taken in making and fitting this door that it swings freely and so balances that when it is opened and resting against the nail (marked "X" in the lower drawing) that the door will remain open. As the hen enters the rear nest she will push the door over the center balance causing it to fall forward and close. The front half of the nest is partitioned from the rear with a narrow strip. This holds the nesting material in the back of the nest and also forces the hen to close the door as she passes into same. After the hen has laid, she then comes to the front, thus protecting the egg which is in the nest proper.

The door is really nothing more or less than practically what you might call a third of a circle. The straight portion of the door is 7½ inches in length and the rounding portion is 13½ inches. This door is fastened to each side of the nest box with long slender screws. Small holes should be bored in the door at the points shown in the illustration so that the door will work freely back and forth on these screws. After the hen has laid and comes to the front section and the attendant goes to get the egg, the door is simply raised which closes the door behind her and she can be easily removed from the front of the nest.

We really consider this the best of all trap-nests that we have used to date.

Figure 60 represents a view looking down on the top of two trap-nests, also a front elevation of the nests showing one revolving door closed and the other open. Each of the revolving trap doors are covered with screen wire. The top of the nest is covered with poultry netting; the nests are built of as light material as it is possible to obtain. They are built in sections of two, or pairs, so that they can be easily removed, thoroughly cleaned and disinfected. The frame work, to support the nests, is made on the side of the wall or underneath the droppings board. These nests simply rest on this frame work so that they can be put in place or removed at will.

Each of the nests is about 12 inches wide on the inside and 24 inches in length and 12¾ inches high. The rear of the nest is boarded up except about ¼ inch of space which is left in the back near the floor so that the dust and filth that accumulates in the nest can be easily brushed out at cleaning time.

Figure 61 illustrates the trap-nest with a view of the revolving door in detail.

In plan "B" you will see the trap door as it is constructed, the rounding portion of the door being covered with screen wire. You will also note the screws in place and these are screwed into the side walls of the nest at the point shown in the side elevation "E." Holes should be bored in the door to accommodate the screws, and they should be a trifle larger than the screws, so that the door will work freely back and forth. A detail of the trap side of the door is shown in plan "C." You will note the grooves made for the cross pieces which hold the wire and make the door more rigid. In plan "E," showing the side elevation, you will note the position of the screws on which the door revolves, and you will also note the position of the nail or screw which supports the door when it is open. After the hen passes into the front of the nest, as she attempts to pass over the four-inch partition in the center, her back touches the door and as it is just on a balance it easily and quickly falls forward and closes the

trap behind her. You will see that the rear of the nest is a trifle larger than the front portion. The nest material is placed in the back of the nest and the nest divided from the front with a four-inch partition.

Fig. 61-A.

You will find this nest one of the simplest and best you can possibly build. The screws which hold the door in place are about four inches above the floor of the nest and about 5½ inches from the partition. The nail or screw which supports the door when the trap is open is about four inches above the center partition. It would be better to place this above

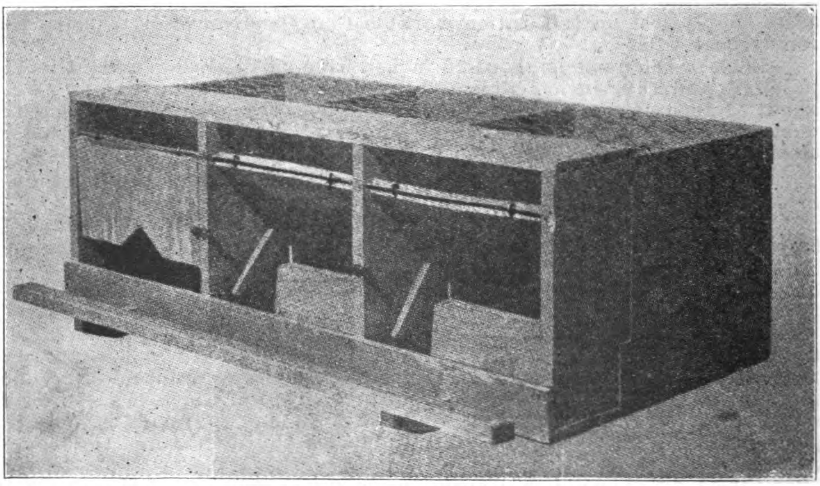


Fig. 62.

the partition and in line with same, rather than in the position shown in the illustration.

Figure 61-A shows the revolving door trap nest in operation. One hen has just been removed from the nest and the attendant is reading her band number, preparatory to making a record of same. The trap-nest on the left shows a hen just inside of the door which has laid and has come to the front of the nest to be released.

Figure 62 illustrates a three-compartment nest that is used by the government and by a number of poultrymen. It is a very simple nest. As a hen enters, her back raises the door and releases the trigger which allows the door to close. The trigger should be set so the edge just holds the door, which is regulated by the screw or nail in the lower inside edge of the catch. A washer should be placed on the screw (d) between the catch and the side of the nest to prevent this catch from striking. The guard (b) around the catch keeps the nesting material away from the catch. The length of the trigger which supports the door and the triangular notch in the door may be varied slightly for very small or very large hens.

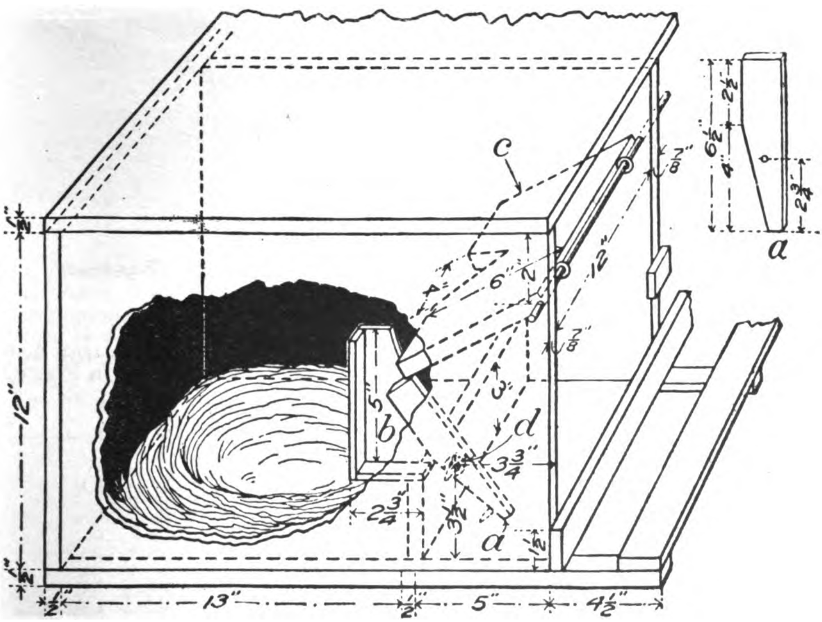


Fig. 63.

Figure 63. The Government's instructions for building these nests are as follows:

Cut four ⅞-inch boards for ends and partitions, 12 inches wide by 19 inches long, enough ½-inch boards, 39½ inches long, laid lengthwise, to cover the top, back and bottom, and one strip 39½ inches long and 1½ inches wide for the front of the nests. Cut three pieces of ½-inch boards, 12 inches long and 3 inches high, to insert in the nest to hold the nesting material away from the door.

Nail the top, back and bottom to the ends and partitions (see fig. 2), insert the 3-inch strips in the nests and make the guard (b), nailing it to the left side of the nest. Bore a hole in the catch (a) large enough so that the catch will move freely when screwed into position on the side. Place a washer on the screw between the catch and the side of the nest. Place a screw at the lower edge of the catch to stop it when set, so that the catch will just hold the door.

Make the doors (c) of ⅞-inch material, 12 inches by 6 inches, and cut

a triangular notch in the center 4 inches wide. Put two screw eyes in the top of the doors and more holes in the front of the nests 2 inches below the top (inside measurement), through which a $\frac{1}{16}$-inch wire is run to support the doors.

Attach a narrow strip to the front of the nests for the hens to jump upon when entering the nests. Place a button or block of wood on the front of each partition to hold the door when the nest is closed.

If the nests are to be placed directly below the droppings board, a wire top should be used on the nest, except for a 5-inch strip of wood on the front edge of the top to stiffen the nest.

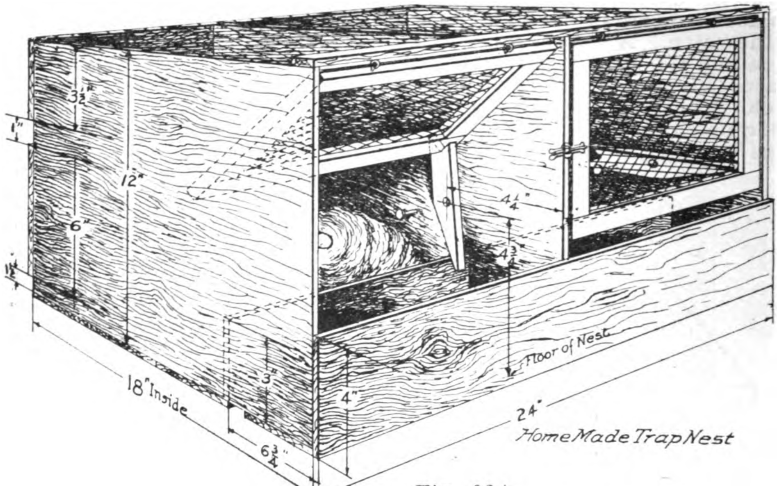


Fig. 63A

Fig. 63A shows a front, end and top view of a home made trap nest. You can use practically the same idea and dimensions as shown in Fig. 63.

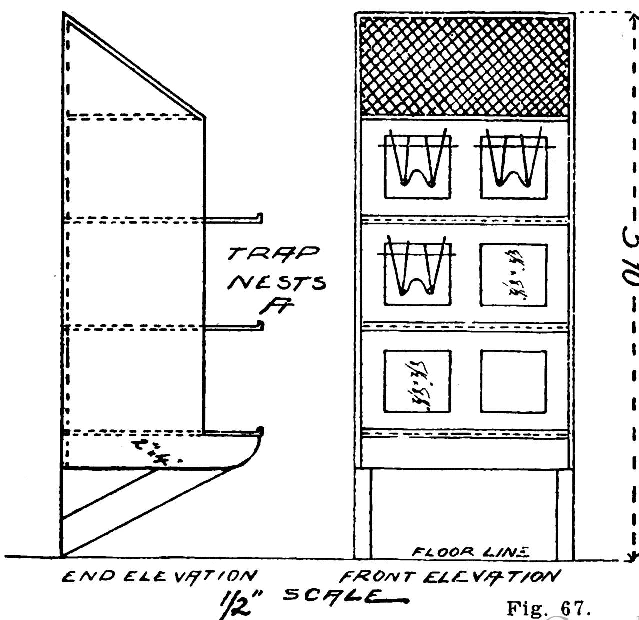


Fig. 67.

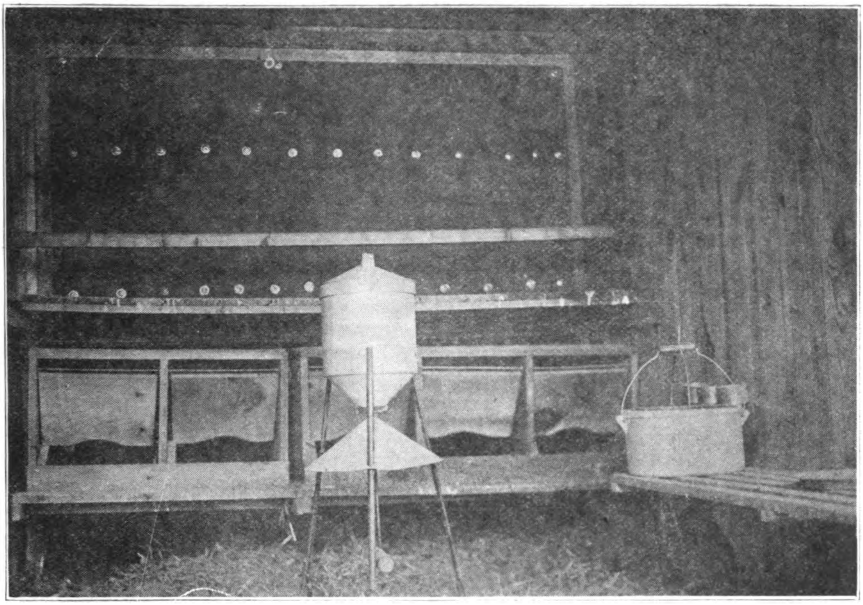


Fig. 68.

Figure 67 shows the front and end elevation of a bank of trap-nests that have been placed along the wall of a poultry house. The same arrangements will do for wall nests which open to the front. You will note there is a runway in front of each tier of nests; you will also note that the frame at the top is made slanting and covered with poultry netting so that the hen cannot roost on same. The nests are up off the floor a considerable distance so as to give additional scratching room beneath.

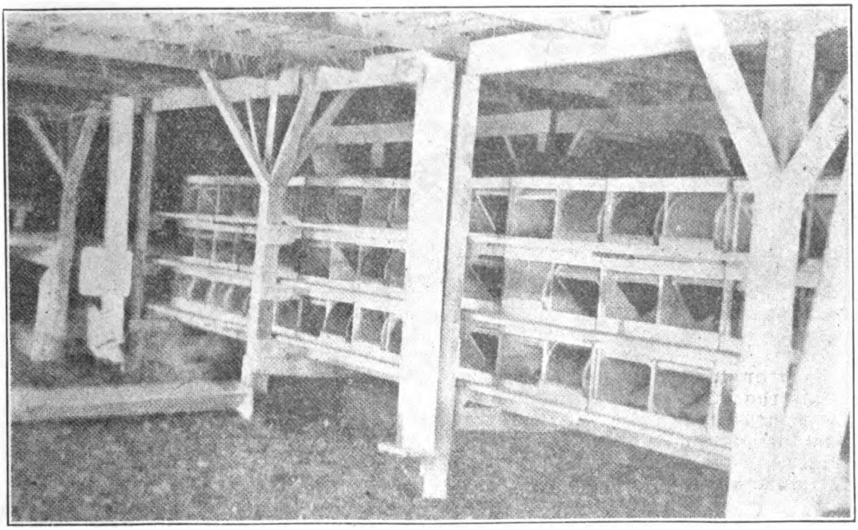


Fig. 69.

Figure 68 shows the trap-nest beneath the droppings board. You can also see that the space back of the roof is covered with composition roofing or tar paper so as to make the roosting quarters warmer in winter months. An open dry mash hopper will be seen on a platform on the right hand side of the house and you will note that this platform is made of 1x2 or 1x4 slats with an open space between which makes it more sanitary than a solid board would be.

Figure 69 illustrates three tiers of nests or trap-nests placed through the center of a large poultry house, or these nests may be placed against the wall, but in this particular case they are placed in tiers, three high, and in double rows, the same number of nests being on the opposite side and placed back to back. The runway in front of each row of nests is made of 1x4 material and is hinged so that it can be raised when the nests are visited the last time in the evening. When these are raised it makes the 1x4 cover the opening to the nest so that it is impossible for the hens which are inclined to be broody to get on the nest and remain there all night. You will also note that this house has a straw loft, and you can see the moist mash feed troughs that are hinged at the bottom and fastened against the center post. When you wish to feed the moist mash, these troughs are let down into place, then hinged up again out of the way when the birds have finished eating.

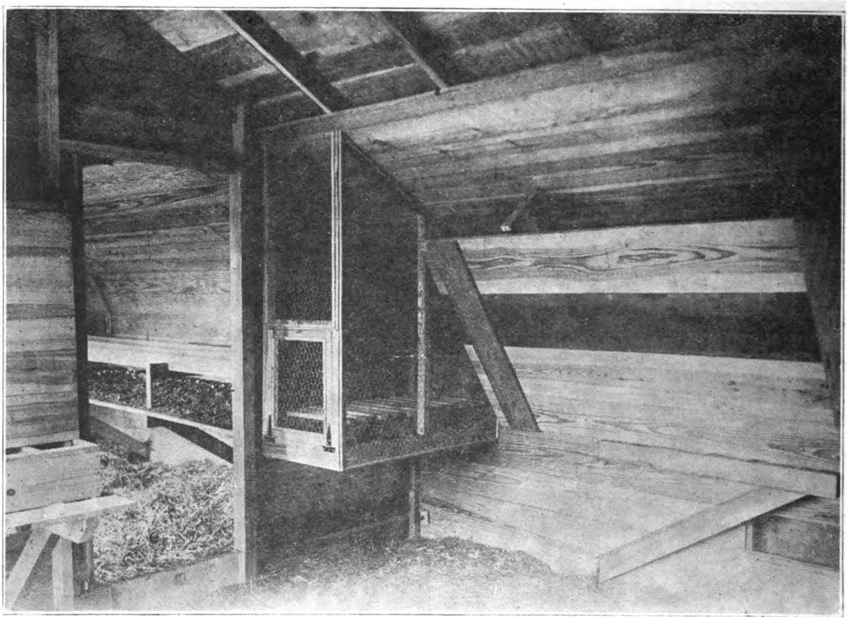


Fig. 70.

Figure 70 shows a portion of a large dry mash hopper. On the extreme left of the illustration, in the corner of the room, will be seen a coop for broody hens. To the right side of this you will note the roosts and droppings boards raised and fastened to the ceilings. This prevents the birds from sitting on the roosts during the day time and makes all portions of the house lighter and more easy of access. You will note just below the droppings board the support for the boards and roosts. This is hinged against the wall and is pushed back out of the way. This is a very satisfactory arrangement of the fixtures for a poultry house.

Figure 64 is one of the best arrangements we have ever used as a roost pole. The poles are made of 1x2's with edges rounded. They rest on a piece of 2x6. A 16 D nail is driven through the pole into the 2x6 support. The nail is driven in so that the pole does not rest against the support, but is supported by the nail, and there is a space of practically one inch between the support and the roost proper. This does not leave any place for the mites to harbor. Twenty penny nails are driven into the underneath side of the 2x6 and instead of the supports resting on the droppings boards, they are supported by these 20 D nails. The nail is

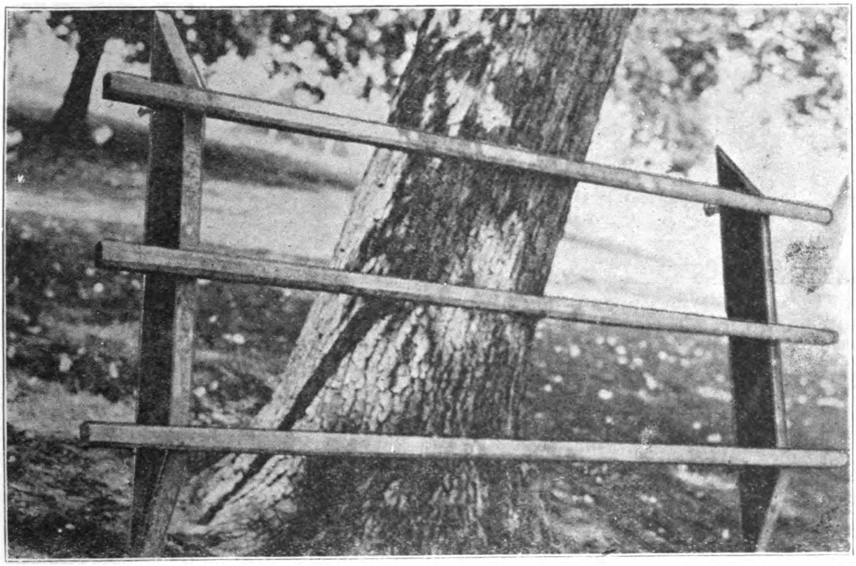


Fig. 64.

driven into the support so that the head of the nail lacks about one inch or more of being driven up to the support and this keeps the support about that distance from the droppings board; this also has a tendency to prevent mites from harboring about the roosts. These poles can be built in sections such as are shown in this illustration and can, therefore, be easily removed and thoroughly cleaned, disinfected and painted. The roost poles should be about 14 inches apart.

Figure 65. This illustrates the roost poles we use in our poultry houses. The supports for the roost are made of 2x6's and cut to a point as is shown in this illustration. The front point of the support is cut so that it comes even with the front edge of the droppings board. The back point of the support is cut so that it touches the back wall at the rear of the roosts and droppings board. When the boards are to be cleaned, the back point of the support acts as a sort of hinge so that the roosts are simply raised and fastened to the ceiling with a screw hook and eye as is shown in this illustration.

You will also please note the large nails driven on the underneath side of the supports and also please remember that the roost poles are supported by 16 D nails, and not driven close into the support. You will find that this sort of a roosting device is one of the most satisfactory you can use. No hinges are necessary; the roosts are always in place and the device can be easily removed from the house when necessary. The roost poles should be made of 1x2 material, with the 1-inch edge rounded and turned up edgeways.

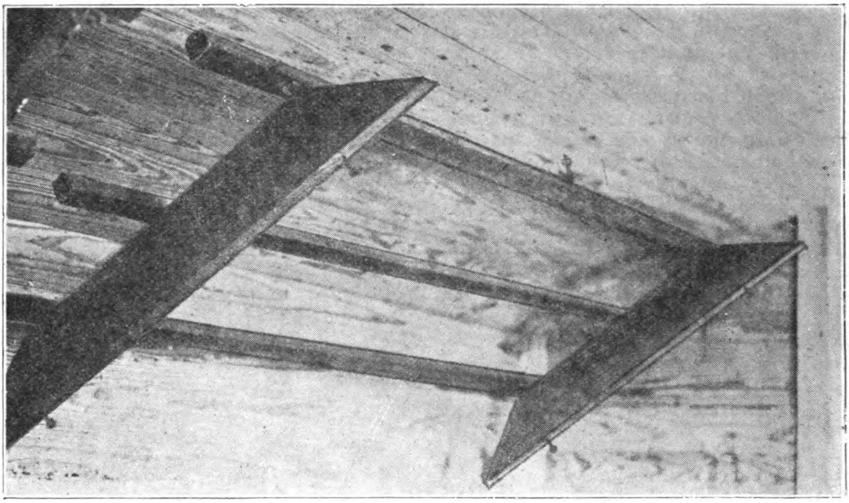


Fig. 65.

Figure 65-A is a device on which the roost poles are placed. These cups can be filled with oil and are a great aid in preventing the mites from crawling to the hens. This is inexpensive and should be found very useful in the fight against the mites. If you cannot secure a support with a cup attachment similar to this, a lamp wick or flannel cloth may be tacked

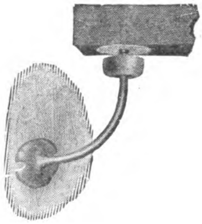


Fig. 65-A.

about the ends of the roost poles. Keep this saturated with a mixture of equal parts of Crude oil and Carbolic Acid. It will prevent mites from crawling from the cracks in the house to the poles at night. But the best thing to do is to treat your houses as directed in the "Enemy and Parasite Lesson," and prevent mites.

Figure 71 is a home-made combination roost and nest box. It has the advantage of not being attached to the wall. It can easily be taken apart and taken outdoors for cleaning. It is really nothing more or less than a small table with the nests built underneath the top from which the eggs can be gathered by opening the door in front. The roost poles are made separate so that they can simply be laid on the table or removed when desired. The frame, legs, etc., are made of 2x2 material. The table top or droppings board is made in one piece. The cleats that fasten the boards together just fit inside the top of the frame, which thus prevents slipping and makes it easy to remove and clean. The roost supports are merely two pieces, four inches high, with notches cut in, on which the roost poles rest. The roost poles are of 1x2 material with the 1-inch edge turned upward. An oil-soaked cloth is first placed in each notch and the roosts are laid on them. This practically surrounds the roosts with oil,

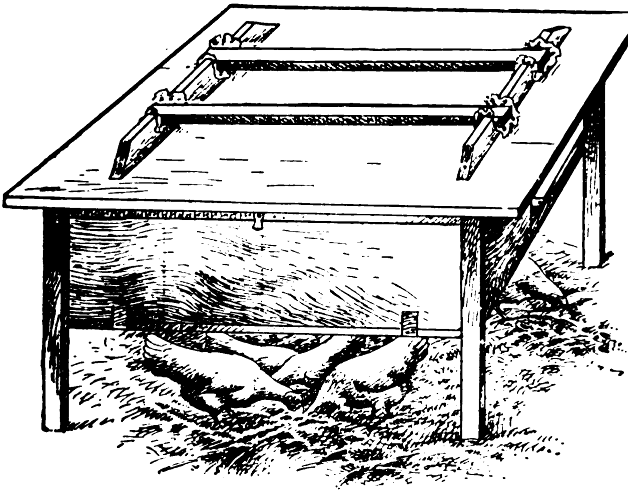


Fig. 71.

which is sure death to vermin that happen to try to reach the roosts to attack the fowls. The nests are underneath in front. Fowls enter from the rear. This provides a dark, comfortable nest. The whole thing can be carried outdoors and thoroughly cleaned and disinfected when necessary. Cloths or wicks wet with oil may be tied about the table legs just below the nest line and this will prevent vermin from getting into the nest from the floor, or nests. Roost poles and droppings boards in poultry houses should be sprayed or painted with good liquid lice killer and disinfected once a month.

COMBINATION HATCHING AND BROOD COOP

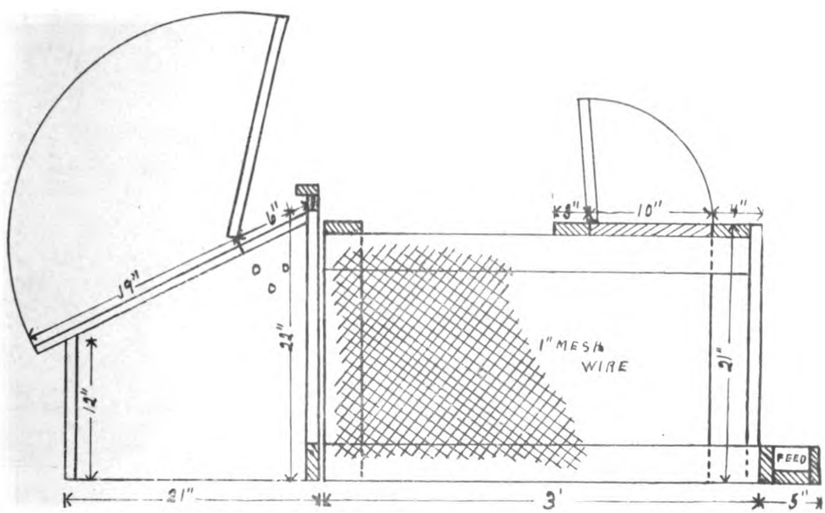


Fig. 72.

Figure 72. The hatching box greatly simplifies hatching by the natural method. Figure 72 represents a side view of a hatching box. The roof of the hatching box is hinged so that it can be raised and lowered and the nesting material taken out after being used one time. It should be made water-proof. Holes should be bored in the sides so that plenty

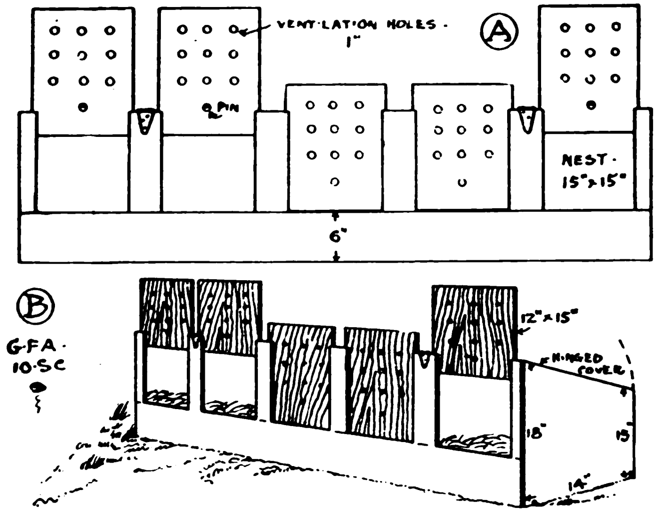


Fig. 73.

of ventilation will be afforded. A runway is made in front so that the hens can have a place to feed and water. A sliding door is placed in front of the coop and can be raised and lowered to permit the hen to come off for exercise and feed. A trough can be made in front and divided into sections for feed, water and grit. The nests can be made five to a section.

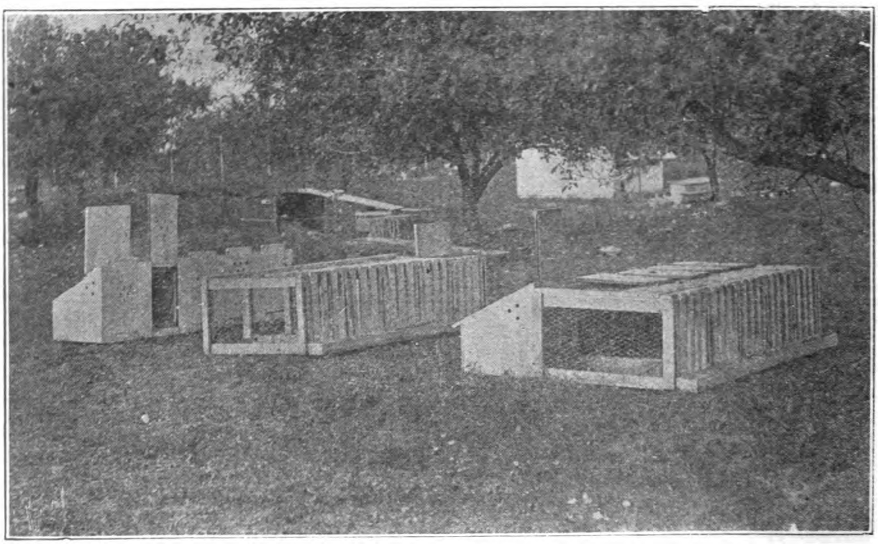


Fig. 73-A.

The nests are made on the ground. The bottom of the nests are covered with hardware cloth. About two inches of earth is thrown into the nests to raise it above the ground, and the nest hollowed out, in which the eggs are placed. If it is not convenient to make a galvanized trough, the feed and water can be placed in the run.

One-inch mesh wire can be used for the sides, but it is better to use

slats in front. The dimensions are indicated on the plan which should enable you to build one of these useful appliances.

Figure 73 is a front view of the same hatching box that is mentioned above. It is advisable to keep the sitting hens by themselves or

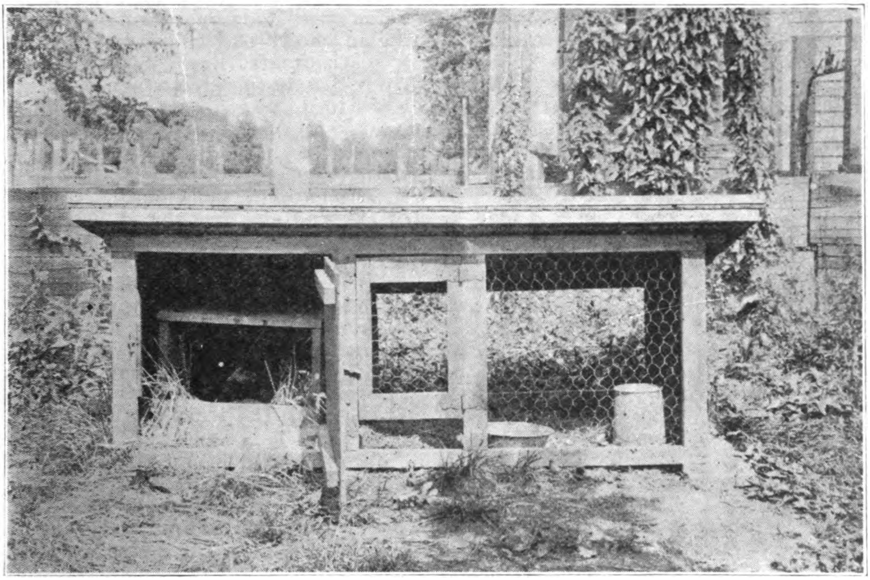


Fig. 74.

they will be a continual source of trouble to you. These nests should be made about fifteen inches in width. A wooden or wire partition may be placed between each of the individual nests. A sliding door should be used for the front with ventilating holes as shown. The runways should be made the same as shown in Figure 72 or Figure 73-A.

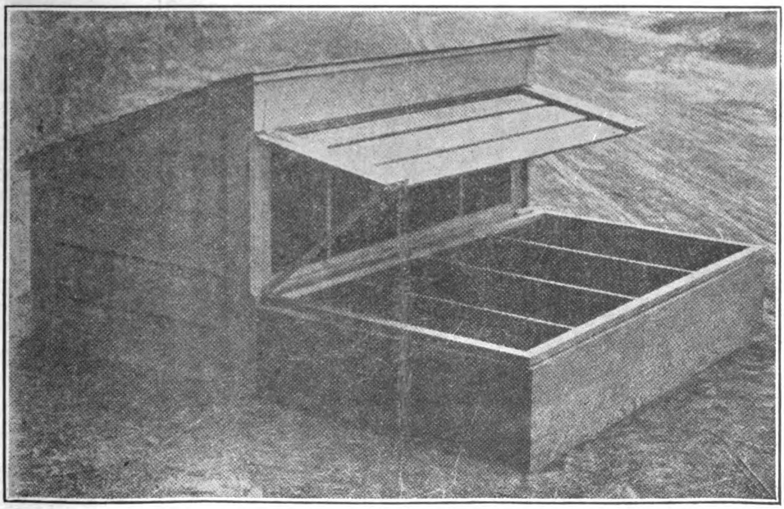


Fig. 75.

Figure 73-A illustrates the above hatching box when in use. The box shown in the front of the illustration is as it appears when completed. There is a long trough which extends from one end of the runway to the other and slats nailed in front of the runway so the hens may eat through same. The feed and water are placed in the front troughs. The nest shown in the rear of the picture shows the front door open and the rear door in the top of the nest raised. It also shows the runway removed a few feet from the coop. The runway in front also has a hinged door at the top so the attendant can reach through same to catch a hen or feed her on the interior of the coop if he wishes to do so.

Figure 74 is a combination hatching and brood coop. You will notice the hen in the hatching box in one end of the coop and she is permitted to pass through an opening into the opposite end where she has access to water and feed. After the hen has hatched the chicks, twenty-five or thirty chicks may be placed with her and she and the chicks will roost in the end where the nest is shown, and both will be permitted to pass out into the open section of the coop where feed and water are kept. You will note there is no floor in the open portion of the coop so that it may be moved when necessary to fresh ground and where they can have access to fresh, tender, green food. The coop is about two feet six inches high in front and eighteen inches high in the rear; it is about five feet in length and two and one-half or three feet in depth. The dimensions may be varied to meet your requirements. There is a small wire-covered door in the center of the coop and a solid board door in the front of the hatching and roosting section.

Figure 75, a combination coop for hatching and brooding, which is made 5 feet long, 3 feet wide, with shed roof, 3 feet high at front and 2 feet high at back. It has three movable partitions, made by fastening canvass or burlap to a 4-inch strip at bottom and a cross piece at top, and compartments made for four sitting hens. There is a three-foot run in

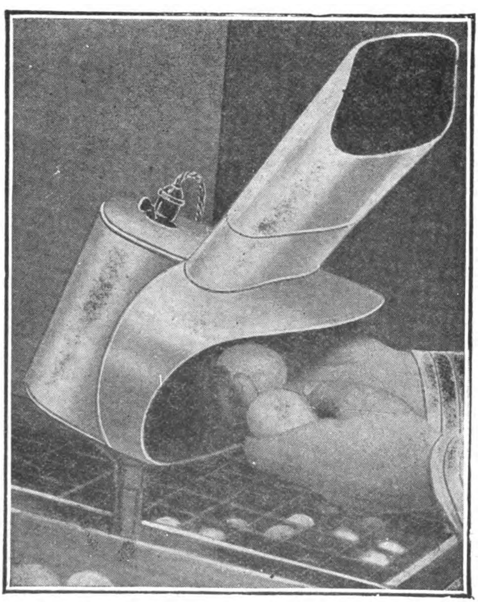


Fig. 76.

front for each hen, which is covered with wire netting. Feed and water are kept in these runs and hens come and go at will. The coop has a door in front which is hinged at the top, and underneath this is wire netting tacked on a frame. This door may be left open in pleasant weather. At

the back there is a door at the top of each section, 10x12 inches, hinged at the top so as to get to the nests more easily. The roof may also be hinged as shown in the illustration. After the four hens have hatched their chicks, the two end portions may be removed, which then leaves the coop in two sections with a partition in the center. The chicks can then be divided into two lots and kept with two hens and the other two hens broken from sitting.

Figure 76 is a "Da-Lite Egg Candler," made by the Grant Egg Candling Co., Kokomo, Indiana. The term "Da-Lite" as applied means that you have no dark room to build. The dark room is built within the candler so that it has perfect darkness just where it belongs, that is, around the egg.

You can use an ordinary electric bulb with these candling devices or you can use dry cell batteries. These devices are being used by many of the large egg dealers and produce buyers, as well as by thousands of retail merchants and grocers. They are built in several different styles; some so that one or more eggs can be tested at the same time. The "Da-Lite Egg Candler" is one of the most dependable devices where a large number of eggs are to be tested.

Fig. 77.

Figure 77 illustrates a "Search Light Egg-Tester." You can take a tray of eggs from your incubator and touch the mouth of the tester or lay it gently on the egg and you can see plainly the condition of the contents. This tester differs from others in the fact that you move the tester over the eggs instead of placing the eggs before the tester. Therefore, you are saved the trouble of handling the eggs for the light penetrates the top of the egg where the germ rests. It is a very effective tester in the early stages of incubation. By simply moving the tester over the rows of eggs, the searchlight effect on the air cells illuminates the entire contents and, as the germ always rises to the top, it is instantly and clearly visible. Weak or dead germs, blood spots, cracked shells or clear eggs are easily distinguished.

This tester requires electric service and is fitted with a Tungsten lamp suited for 120 volt service. If you have a different voltage it will be necessary to replace the lamp that is furnished with the tester for one of the right voltage.

PEDIGREE TRAYS

Figure 78, showing the method used by the American Poultry School, Kansas City, Missouri, for handling eggs in incubators at hatching time to "pedigree" the chicks. Ordinary two-quart corn popper wire baskets are used. Marked eggs from any one individual hen or pen are placed in a basket on the morning of the eighteenth day of incubation and the basket is labeled accordingly. When hatch is completed the operator knows the breeding or parent of each chick and it is so marked.

In most cases, the hen influences the quality of the offspring as much as does the male. In some cases her influence is greater. From the viewpoint of egg production or Standard quality, experience has proved it is equally as important to know the dam as well as the sire of every chicken raised.

Trap-nesting the females during the breeding season; numbering each egg with the leg band number of the hen that produced it; handling the eggs during incubation in the manner set forth in this article in order to insure accurate knowledge of which eggs produced certain chicks, and following this with a system of pedigree banding, these things give us a sure method of knowing the parents of every chick raised.

Not every male or female of the choicest quality as a layer or exhibition bird produces a like quality in all of their offspring. Some produce a small per cent that are extxra choice, the balance poor to medium. Others

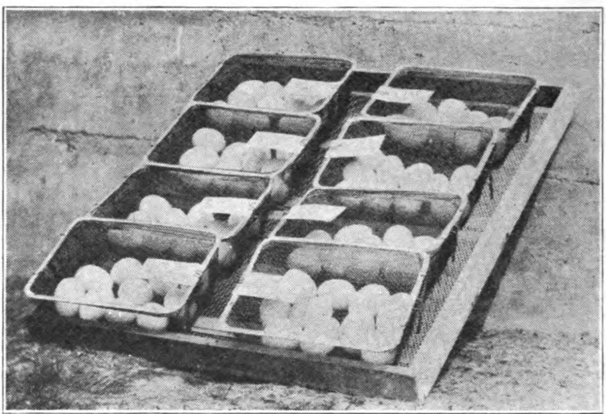


Fig. 78.

produce a few of the very best quality with a small per cent medium, while many chicks are absolutely culls, even from the best matings.

A male or female that produces the best of youngsters—chicks much better in quality than their parents and that have very few or no culls at all among them—are valuable birds to their owner and should be kept in his breeding yards to the end of their days.

A real choice chick, unfortunate in having a large per cent of its full brothers and sisters prove to be of cull or only medium quality, is not as

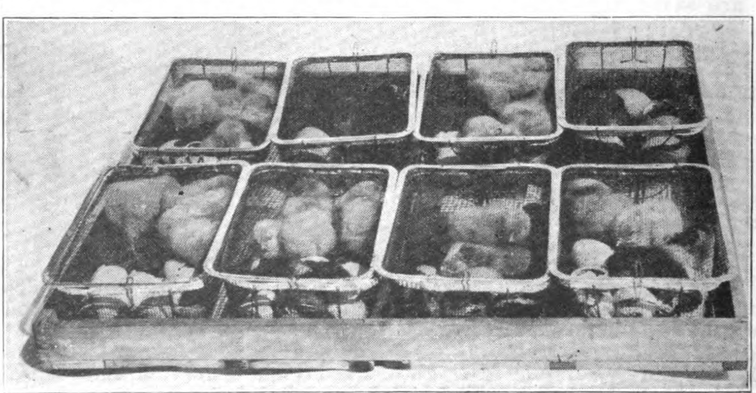


Fig. 79.

valuable to save for breeding as the choice chick whose full brothers and sisters average very good.

Many females seldom, if ever, produce an egg that hatches; others produce some fertile eggs, but the embryo chick dies in the shell before hatching. Still others lay eggs that produce chicks which prove to be of low vitality, are hard to raise and seldom develop into good laying, breeding or exhibition birds. Such birds usually are the first to fall prey to any colds or common chicken ailments. I have known cases where a fine quality female was bred from three years without a chick ever being raised from her.

I have in mind a well known breeder who three years ago "trapped" his breeders and pedigree hatched the youngsters for the first time. As the summer wore on he noticed the shape and color of almost all chicks from his best mating of the season were very fine, but he was keenly disappointed to discover that about one-fifth of all chicks from that mating had side sprigs on their combs, also considerable white on their ear-lobes. He condemned the male (as most breeders do) that had been at the head of the mating. I suggested he investigate his records to see which females were the mothers of the disqualified chicks. When this was done the good man was amazed to find that one was the mother of all the disqualified chicks produced from that mating. That same hen had won second as a pullet and first as a hen at two of the world's largest exhibitions. A further checking disclosed the fact that all of the choicest youngsters were from the most unlikely females contained in his best mating the previous spring. Such important facts and scores of other facts of equal importance to the breeder can be known positively only through trapnesting and pedigree hatching.

On the twenty-acre Poultry Experimental Farm operated by the American Poultry School, every female worth keeping is worth trap-nesting, at least during her pullet year. This proves her actual laying ability. Their eggs are marked with the number on the band which was sealed on the leg of the female at the time she was placed in the breeding pen. The eggs from different females if placed in incubators are sorted on the afternoon of the seventeenth or the morning of the eighteenth day, and eggs which are marked as being laid by a certain individual, are placed in a pint, a quart or two-quart size wire corn popper basket. The lid is fastened down and a record card, showing what the basket contains, is made and fastened underneath the lid hook. All eggs in the tray are treated in a like manner. The baskets are next set in the tray, and it is placed back in the machine.

Fig. 79. The above illustration shows chicks from eggs which were first divided according to the pen or female that produced them. As each popcorn popper basket is removed after the hatch is completed the chicks in it are marked.

When the hatch is finished, each basket of chicks is taken from the machine and opened and the chicks are banded with small open pigeon leg bands. The breeding leg band number of the hen that laid the egg is recorded on a permanent record sheet and opposite her number is placed the pedigree band number of each chick hatched from her eggs. When the chicks are about eighteen to twenty-four days old, the small band is removed from the leg. A small slit about one-eighth of an inch long is made close to the edge of the skin which creates the "fan" portion of a fowl's wing when it is opened. This is the skinny or what you might call the web portion of the wing when outstretched. The pigeon band removed from the leg is placed through this slit in the wing skin. The band is then folded shut and the chick is marked for life. They never lose their wing bands. Feathers grow over this portion of the wing and the wing band is never noticed except when a careful search is made among the feathers expressly to find it.

When it is desirable to know the chicks hatched from eggs produced by certain pens instead of females, larger popper baskets can be used. Most hardware stores handle them in sizes from pints to one and two gallons. The prices of these baskets range from fifteen to sixty-five cents, depending upon the size.

There are other methods commonly practiced in incubation to tell which egg produced the chick among which are small hand-made mosquito netting bags and manufactured pedigree trays. We have found chicks often work their way out of the netting bags or the mosquito netting holds the shell over the half hatched chick and it dries there and sometimes kills the chick. Also it requires more time to pedigree hatch when bags are used. The main objection to most all manufactured pedigree trays is that the divisions are not sufficiently numerous to permit economical use of tray space when the incubator tray contains from one to four eggs each from several different females and as many as ten or twelve fertile eggs are in the machine from a certain female. In such cases we use different size popper baskets, using the one best suited to the number of eggs from any female. This method is sure, easy and a time and money saving method. It also leads you to certain success in building up an egg producing and Standard-bred flock that will win prizes for you providing your other methods are correct.

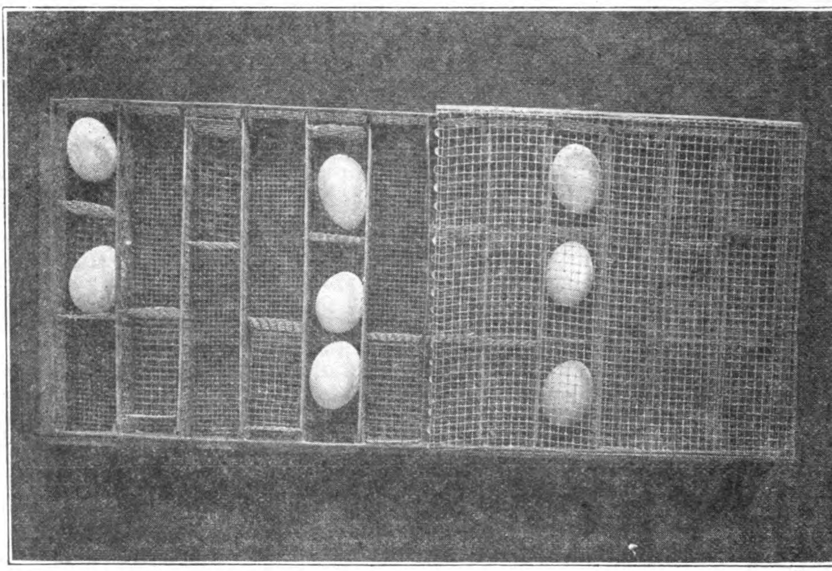


Fig. 80

Fig. 80. A pedigree egg tray showing the eggs in separate compartments. Eggs are not placed in the pedigree trays until the 18th day. The trays shown here were made by a tinsmith. The trays are 2½ inches deep and the partitions are 2 inches apart. Pieces of hardware cloth can be bent so as to subdivide the compartments as here shown.

Pedigree trays for this purpose can be bought from any of the better incubator companies or poultry supply dealers. Your hardware merchant can make them for you out of hardware cloth. They should be just the proper size to fit on the inside of the frame of your incubator tray. The wire bottom of your incubator tray can be used for your pedigree trays. All you are required to have made are the sides, ends, tops and partitions as shown in the accompanying illustration. The trays should not be less than 2¼ inches deep and the partitions should be at least two inches apart. Each hen's eggs can be put in a separate compartment. By bending short pieces of the hardware cloth, the sections can be subdivided for a single egg even. If the eggs are marked on the small end, that portion of the shell will usually remain in the tray with the chick, unbroken, so that the records and pedigree can easily be kept. Small tin grooves can be soldered on the sides of the trays into which the partitions can be slipped or re-

moved. After the eggs are put in the tray, the top should be wired on until the hatch is completed.

BABY CHICK SHIPPING BOXES

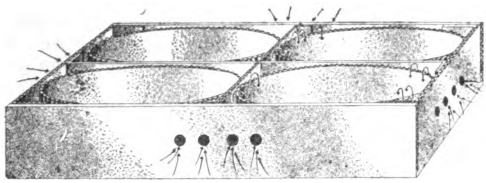


Fig. 81

Fig. 81. The baby chick business has grown to be quite an extensive branch of the poultry business. The large part of the breeders of pure-bred poultry now sell more or less baby chicks and there are a large number of hatcheries in every state and one or more in practically every community where much poultry is raised. Each of these hatcheries makes a business of selling and shipping baby chicks. In order that the chicks carry well and reach their destination in good condition it is necessary to have a lightweight, yet substantial and cheap shipping box. Most of these boxes are made from corrugated paper. The box in the above illustration is sold by the Ripley Manufacturing Co., Grafton, Illinois. The circular boxes on the interior prevent the chicks from crowding into the corners, but they also prevent a free circulation of air to some extent and unless you punch extra holes in these circular partitions or remove them entirely from the box proper your chicks may smother if they have to travel any distance.

It is not safe to ship baby chicks where many changes have to be made en route of where it requires longer than thirty-six hours for them to reach their destination. If they have to be shipped a longer distance than this it is necessary to get them out of the machine and into the boxes before they are thoroughly dry. Do not put them in the boxes until you are ready to deliver them to the parcel post office or express office. It is also a good idea to nail two small strips, one inch square, either on the lid or on the bottom of each box so that the chick boxes piled on each other will have an air space between them. This also strengthens the box and makes it more rigid. The bottom of the box should be covered with burlap, clover leaves, alfalfa leaves, bran or some other material to give the chicks a toe hold and prevent them from slipping about in the box. See that the burlap is fastened to the bottom of the box so that it will be impossible

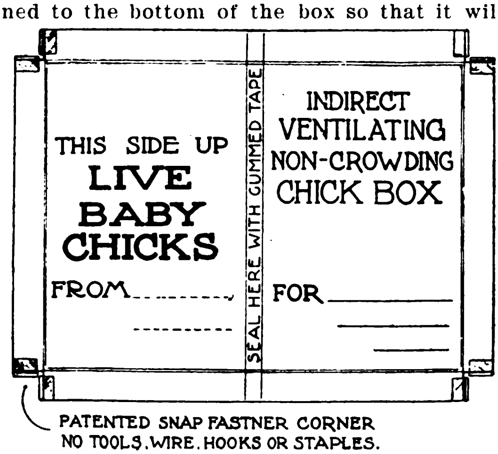


Fig. 82

for the chicks to get under the edges and others to crowd on the top of the burlap and thus smother and trample the chicks underneath. These baby chick boxes can be purchased from any poultry supply house.

Fig. 82. This shows the lid of the baby chick boxes. It is necessary to have the words, "Live Baby Chicks," printed in large type so that the expressman, postman or those in charge of the package will handle them with extra precaution. See that the shipping directions are very plain and distinct and also have your own name and address attached to the lid of the box.

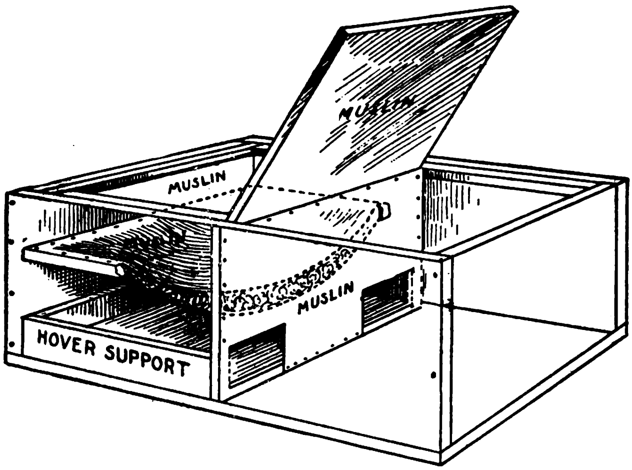


Fig. 83

Figure 83 represents a home-made fireless brooder for little chicks. We do not recommend heatless brooders, as a rule, but sometimes there is delay in the delivery of a brooder which usually puts the novice in a quandry what to do with young chicks. A brooder for temporary use may be made as follows:

Take a box with a hover about 18x24 inches square and 10 inches high or this brooder can be made from a soap box or shoe box. Muslin must be used as indicated to insure life saving ventilation day and night. A hover pad that rests on the back of the chicks must be made of several thicknesses of warm material. We usually take two pieces of cheese cloth or cheap muslin and make a small tacked comfort which just fits snugly over the muslin covered frame. Chicks nestle beneath the hover pad as it rests on their backs. Be sure to use muslin in the partition. After the chicks have been in this brooder for three or four days then can be allowed exit from the front half of the brooder. Twenty-five to fifty chicks will thrive in such a brooder. The size of the hovers may vary from 15x15 inches to 24x24 inches. Locate card board or wire mesh in corners of brooding apartments to prevent the chicks from huddling or crowding. This sagging muslin covered frame rests on the backs of the chicks, and comforts or cloth covering of some nature is placed over this sagging muslin and the amount of covering used depends upon the season of the year.

Fig. 84 "B"

Fig. 84 "B" is an illustration of a "Pettey Poultry Punch." This is used in punching the toes of baby chicks just as they come from the incubator. If you only have a few chicks to mark and do not care to go to the trouble of using the open pigeon bands and make a record in that way you can mark the chicks from various hens by puching the web between the toes of each foot. That is, you may punch the web between certain toes for chicks hatched from certain hens or certain pens. The web between other toes may be punched for other birds. Then in other cases, you may punch two or more of the webs and get various combinations in this way, as shown in our incubation lesson. You can also get still another combination by using a sharp pen knife and making slits in the web instead of the round punch marks. You may use the punch between certain toes and the slit made with a knife between other toes. In this way it is possible to get chicks marked in ninety different manners so that no two will be exactly alike.

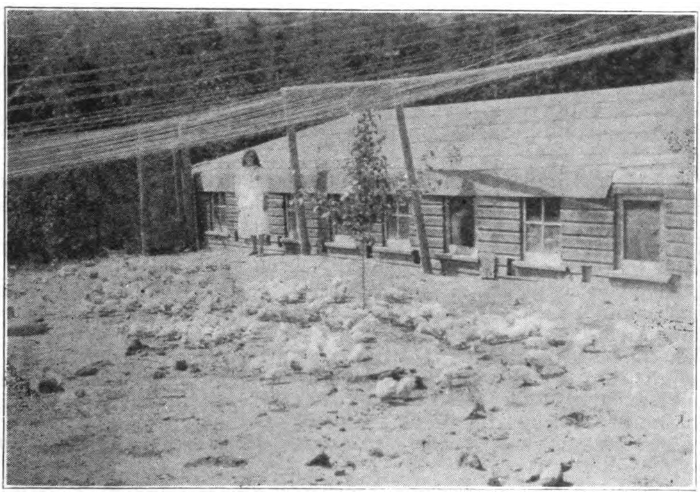


Fig. 85

Figure 85 shows a method of preventing hawks and crows from preying on the growing stock. One source of great loss to many poultrymen are enemies of this sort. The magnitude of the loss can scarcely be realized for in some cases we have known where more than half a flock has been carried off in this way. The Maine Experiment Station reported a great deal of loss from this source and a good deal of attention was devoted by them to the problem of how these losses might be cut down, and the result of their experiments may be of some benefit to other poultry keepers.

"In the experience of this station, the most destructive natural enemy of poultry in the long run has been found to be the crow. The depredations of the hawks are more spectacular perhaps, but in the long run far less destructive. A hawk will only visit a poultry yard occasionally, and especially if he is shot at once or twice will be very wary about approaching it again. On the contrary, the crow is a steady and persistent robber. He will continue his depredations just as long as it is physically possible for him to do so. While there may be some doubt as to whether crows are beneficial or harmful as regards other phases of agriculture, there can be no question that, so far as the poultryman is concerned, the only good crow is a dead one. For a number of years the crows killed and either carried away, or left behind partly eaten, a large number of chicks on the Station poultry plant. The losses were not by any means confined to the

small chicks, but half grown birds, each nearly equal in weight to the crow itself, were killed, partly eaten, and left behind on the range.

"One after another all the devices which had been suggested by others, or could be thought of by those in charge of the poultry work, were tried in order to stop these ravages. In a single year the crows destroyed something over 500 chicks. One important reason for these heavy losses is the location of our poultry range. It borders upon a pine forest in which the crows congregate in great numbers. In the case of a range farther from the woods, the losses, without protection, would not be nearly so heavy. Various sorts of 'Scare-crows' were tried but with no effect whatever. Dead crows were hung up on stakes about the yards as solemn warnings to their fellows, but instead of operating as warnings they appeared rather to serve as 'invitation' to the dance. Decoying the birds in various ways so that they might be shot was tried, but with very slight individual success and no substantial effect on the steady losses. Poisoning is reported to have been used with success in other places, but has never been tried on the station plant. It ns doubtful whether it is justifiable save under very exceptional circumstances. The point is that it is difficult to manage affairs in such a way as to insure that only the crows will get the poison. There are so many useful and valuable animals about the farm that might easily get the poison before the crow did, with a resulting loss greater than that caused by the crow that it would seem wise to resort to poisoning only when it can be done under well controlled conditions.

"The plan which has finally been adopted at the Station poultry plant for dealing with crows is one which is perfectly safe and sure in its operation. It consists simply in running strands of binder twine about two feet apart over the whole of the poultry range occupied by the young birds, until they reach such size that they aer able to take care of themselves. These strings are run over the tops of the brooder houses, and on supports made by cross strands of either wire or two or three strings of binder twine twisted together. These cross strands are held up by posts when necessary. The whole network of strings thus formed is put at such height that the attendants in working about the yard, will not hit the string when standing upright. The area covered in with strings in this way on the Station poultry plant is usually three acres per year. The expense of covering this area is from $15 to $20 for twine. The labor of

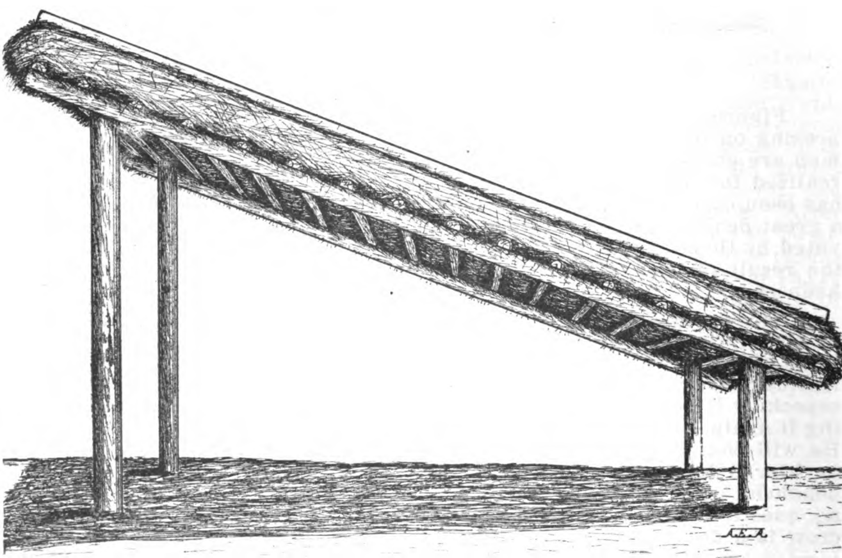


Fig. 86

putting it up is comparatively small. It forms a perfect and complete protection against both crows and hawks.

"The appearance of the range when covered with strings is shown in figure 85:"

Figure 86 illustrates a temporary shed which is used as shade for growing stock or in any poultry yard where shade is lacking. The sides might be covered with poultry netting and roosting poles put beneath same if one was desirous of using it as a summer house. This shed is two feet high in the rear and five feet high in front. It can be built any size, but as it is shown in the illustration, it is supposed to be eight feet wide and twelve feet deep. It might be better in some cases to make the shed longer and not so deep. If it is made longer than ten feet, however, it would be necessary to have extra supports in the rear and front in order to keep the poles or lumber from sagging.

Hay or straw thatching is placed about ten inches thick and then the upper poles tied into place, which would compress the hay until it remained about six inches in thickness. This would make a place to keep feed and water and also make a cool place for the poultry. The poles on top are placed so that they will run from the top to the rear of the shed, or in the opposite direction from those underneath. This aids in carrying the water and serves to hold the hay more firmly in place. Poles or lumber may be placed close together and the straw dispensed with if you prefer to make the protection in that way.

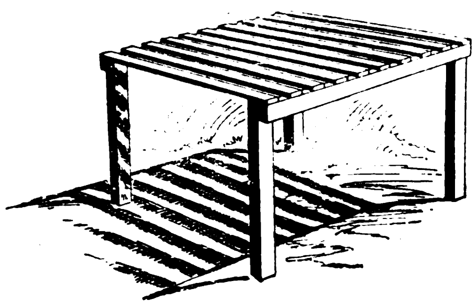


Fig. 87

Figure 87 is a sun shelter made of elevated slats or poles. These are placed on a light frame and elevated on four or more posts. The frame is about two or two and one-half feet from the ground. Some use slats and others use poles and some prefer a solid platform. You will find that the birds will get underneath these on hot days and you will find that they take pleasure in sitting on the top of the shelter when the ground is wet and damp. Make them large enough or have a sufficient number of these shelters so that it will not be necessary for the birds to crowd.

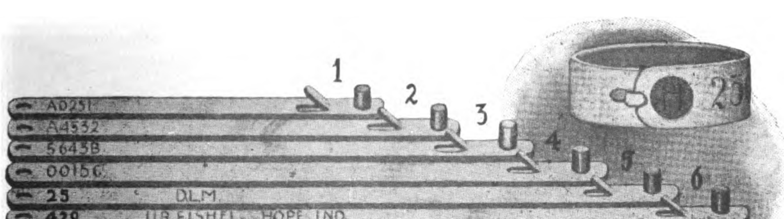


Fig. 88

Figure 88 represents one of the best makes of permanent leg bands. They are what are known as the "Smith Sealed Band" sold by the Keyes-Davis Co., Battle Creek, Michigan. You can have your name or initials

stamped on the band if you want that done. The bands may be obtained in any size you wish and every band numbered with a separate and distinct number.

We advise using leg bands with raised numbers instead of numbers cut into the band. If you have the numbers cut into the metal or aluminum the figures will become filled with dirt and filth and the numbers will not be easily visible. If the figures are raised they can be distinguished at a glance. This same company also makes a plain pedigree band or open pigeon band with numbers on them which we use in pedigreeing baby chicks. The method of pedigreeing chicks is described in another portion of this lesson and the method of placing the leg bands in the wing of the chick is shown in our lesson on incubation.

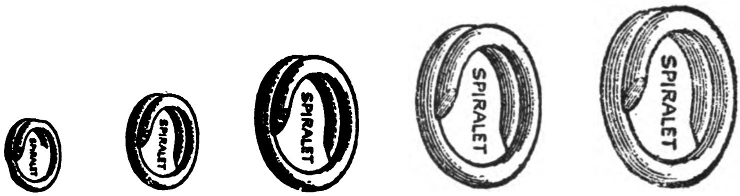


Fig. 88 "A"

Figure 88 "A" shows the "Spiralet" band made of celluloid. These come in various colors—white, red, green, blue ,etc. They also come in many different sizes and they are sometimes quite useful in readily distinguishing chickens of different matings, that is, all chicks of a certain family may be marked with a red band as well as with sealed bands containing the numbers. This would enable you to know all of the chicks

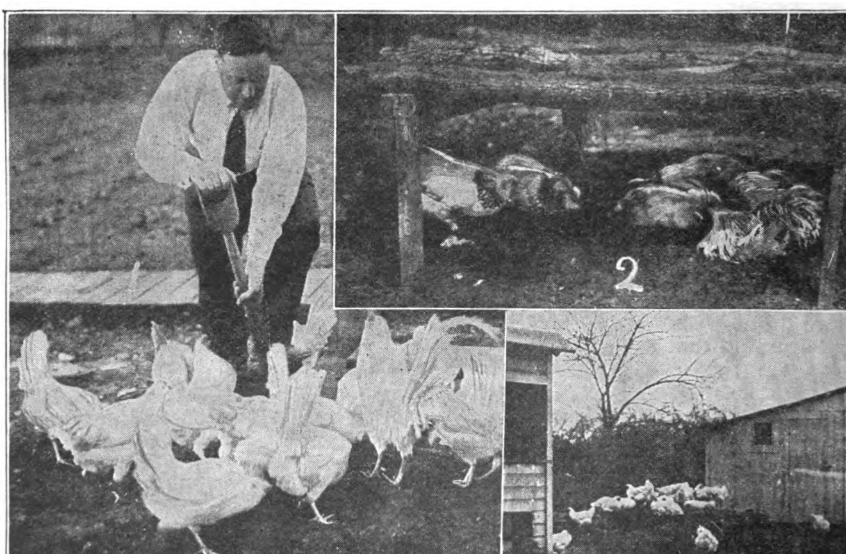


Fig. 89

with this color band were from a certain family or mating and save the trouble of catching the chick and examining the sealed band number in order to know definitely the breeding of a chick. They are also very useful for other purposes. These can be purchased from most any poultry

supply house or you can obtain them from the manufacturer, M. Bayerdorffer, Hugenot Park, New York.

Figure 89 is a shelter out of ordinary poles. In No. 2 you can see the hens wallowing in the dust and shade beneath the poles on a hot summer day. In No. 3 you can see the hens sitting on top of the same poles when the weather was more or less damp and cool.

In No. 1 of this same illustration, you can see the poultryman spading a few shovelfuls of earth in the poultry yard. You will note the hens about his feet eager to get at the bugs and worms. If every poultryman would spade up a few shovelfuls of earth in his poultry yards, every two or three days at least, he would find his hens would get a great deal of pleasure out of working in the soil and also be greatly benefited by same. This is especially recommended where the yards are bare or where your feed is lacking in meat food.

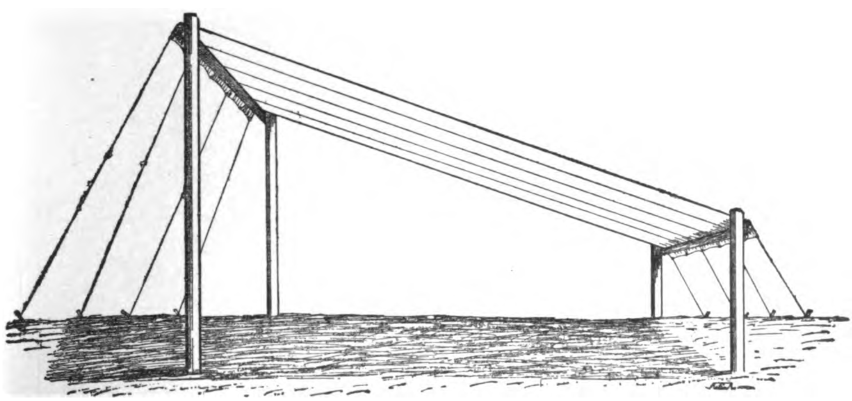


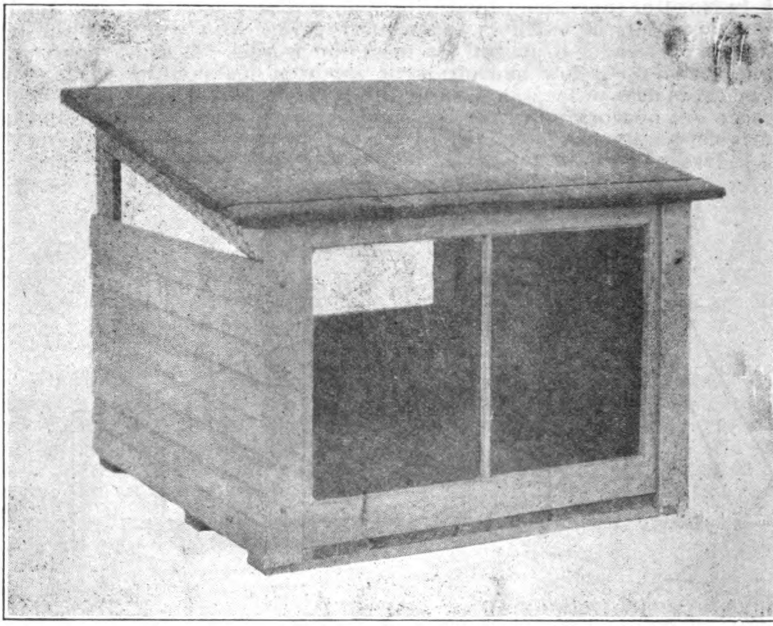
Fig. 90

Figure 90. This poultry shed is four feet high in front and two feet high in the rear. Ordinary poles with a cross bar are used for both the front and rear to hold the muslin, canvass or cover in position. The cloth is then staked down with heavy strings or light weight rope, the same as you use for staking down a tent. Canvass or drill would perhaps be the most economical in the end for if such canvass were properly taken care of it would last through several seasons. This covering should be given a coat of "Tector" which is mentioned in another portion of this lesson. The poles should be driven into the ground and should be about three inches in diameter or made of 2x4's. The cover is not fastened to the supports, but is held in place by the small ropes which are fastened at each end by either sewing the ropes into the edge or clinching tent eyes into the edges of the canvass and running the ropes through these. Ordinary burlap makes a very satisfactory cover. These shade devices should not be built larger than 9x12 feet and it is sometimes best to make them smaller than that and use more of them, depending upon the size flock one must care for.

THE DUST WALLOW

Fig. 91. We think as a rule that it is not best to have the dust wallow in the poultry house. It is possible to use an outdoor box for this purpose and keep dry, fine dirt in which the hens can get their dust bath. For dusting material it is necessary to supply some material that is fine and it should be kept perfectly dry. The idea is to fill the breathing pores of lice to kill them. It is possible to use some very fine coal ashes mixed with dirt and sand so as to supply very fine material that can be admitted to the breathing pores. Some insect powder or finely powdered or ground

tobacco stems can be used in the mixture of sand and coal ashes. By placing the dust box out of doors sunshine can be admitted which will serve to destroy the insects that the hen removes from her body. We give you an illustration of a box which is easily made and with but very



F g. 91—A dust box like this placed out of doors helps to keep down dust in the house.

little expense. A dry goods box can be used for the purpose by sawing down the sides to place the roof on. Give ample fall to the roof and you will have a good dusting place for hens.

There is usually enough dust in most poultry houses anyway and a dust wallow on the inside causes the dust to settle in the feed hoppers, on the drinking water, windows and other objectionable places. If the air is filled with dust it also has a tendency to irritate the throat of the fowls and leads to various troubles. For that reason we think it best to have it on the outside. If it is built in the poultry house, cover it so that the birds' water and feed will be protected from the dust.

Fig. 91-A illustrates a yard where there is plenty of shade to protect the birds from the hot summer sun and also shows clearly the fact that fruit trees and poultry can be grown on the same land, therefore, producing two crops instead of one. The coops, feed hoppers and drinking pans must be kept in the shade and every poultryman should plant trees for this purpose and while he is doing so he may as well plant something that will produce fruit. Certain trees do well in poultry yards and others do not do so well and it would be best to consult your nurseryman as to what he would recommend for your particular locality. If poultrymen would plant some shrubbery, grapes, blackberry, raspberry, gooseberry or some such bushes in their poultry yards, so that the young stock and breeding stock can have access to same in the summer months, you will find they enjoy it very much. Chickens like to congregate beneath shrubbery.

Fig. 91A

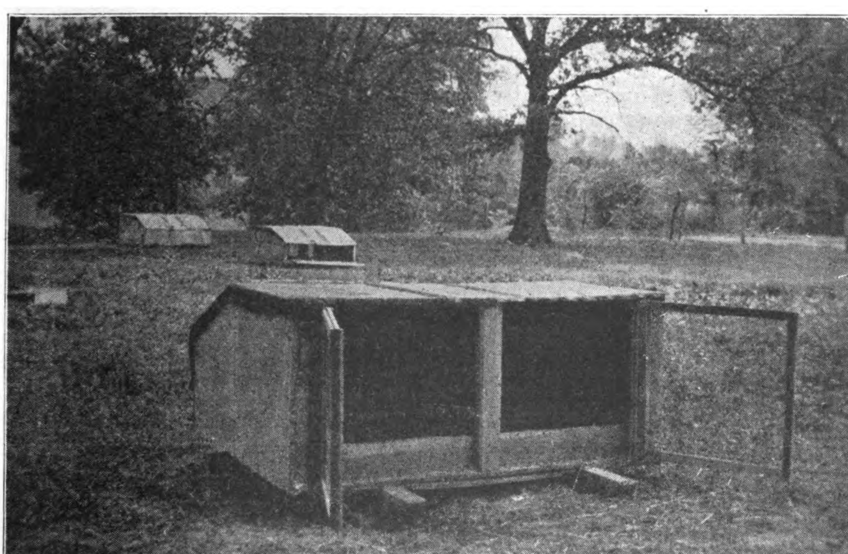


Fig. 92

Figure 92 represents an ordinary piano box that has been turned on the side with the back of the box down. Underneath this you will see that runners have been made of 4x4's; this permits a horse to be hitched to the box so that it may be moved to any portion of the farm. The back of the piano box is used as a floor and roofing paper is tacked over the top and ends of the box. The front is covered with two doors hinged at each side as shown in the illustration and these doors are made of light framing material and covered with one-inch poultry netting.

Roost poles may be used in these boxes for growing stock or for a small pen of breeding stock kept on a city lot.

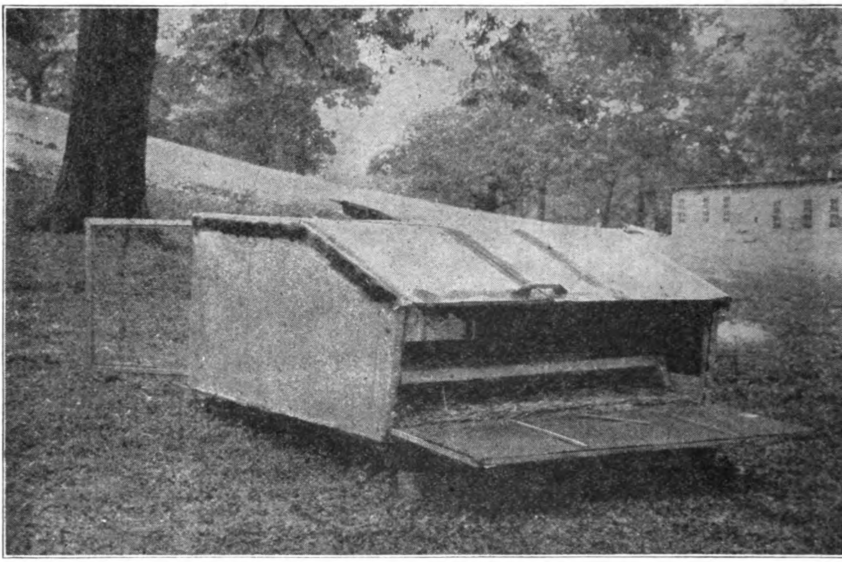


Fig. 93

Figure 93 shows the rear of the same piano box illustrated above. You will note that the rear is made as if it was one large door and hinged at the bottom so that entire back of the box may be opened as shown in the illustration. You will note the roosting poles in position on the interior of the box. These are built so that they can be removed at will. This rear door can be let down and the box easily cleaned from either the front or back. This is a very good coop in which to keep growing stock while on range.

Figure 94 shows two colony houses made from two piano boxes. The boxes are placed back to back, the back of each box being entirely removed. The boxes are placed about two feet apart and then 2x4's are used at both top and bottom, extending from one box to the other, so that the two are held firmly in place. These 2x4's act as rafters above to support the two feet of roof that must be filled in and the sills below to support the two feet of flooring that must be laid.

The roof and the entire outside of the boxes are covered with roofing material. Two windows are made in front for light and ventilation as shown in the illustration. These are hinged at the top so that they can be fastened outward; these openings are then covered with one-inch poultry netting. A two-foot door is made for the center opening which permits the attendant and the fowls to pass in and out of the house at will. The rear of the house is made without openings.

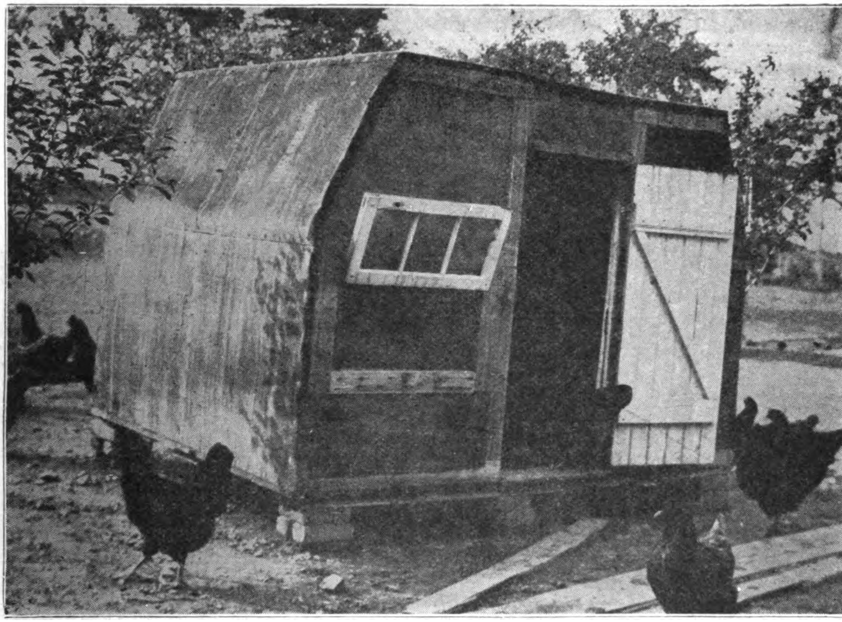


Fig. 94

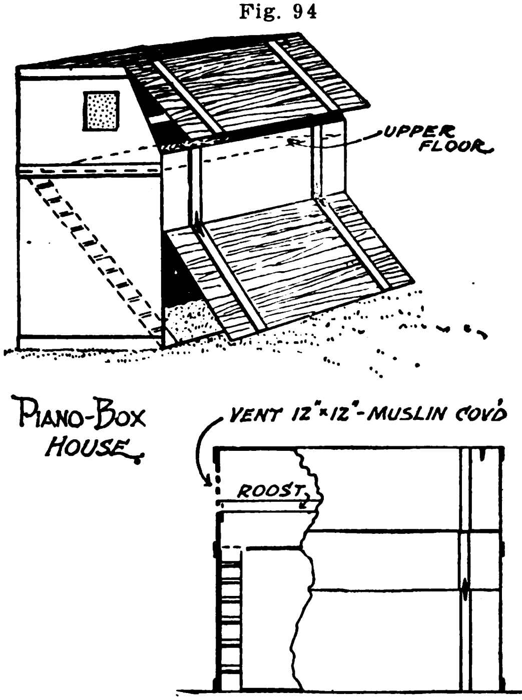

UPPER FLOOR
PIANO-BOX HOUSE
VENT 12"×12"-MUSLIN COV'D
ROOST
FRONT

Fig. 95

Figure 95 is a piano box that has been converted into a house for a breeding pen. Such a house as is illsutrated in Fig. 95 can be converted from a piano box with very little expense involved. At about one-third of the height, the upper floor is laid. Six inches above the floor the roost extends from one end to the other. At one end of the floor there is a 10x 15-inch opening, the long way being the full length of the box with the 10-inch slanting board extending to the lower floor. The fowls use this slatted, slanting board in ascending and descending to and from the up-

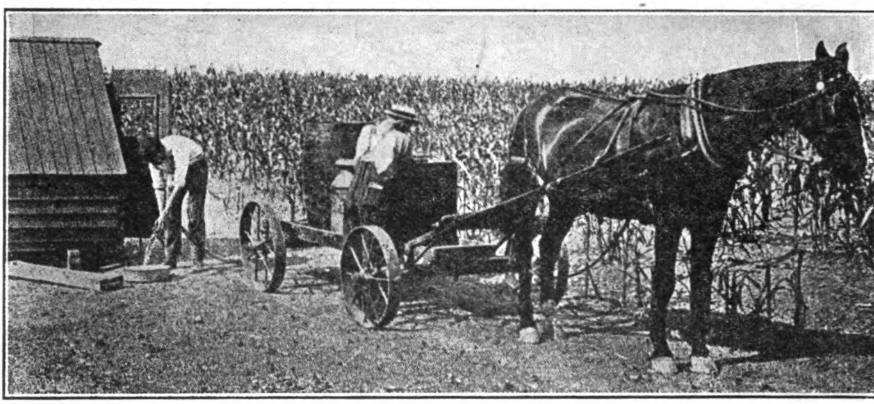


Fig. 96. A handy wagon for a poultry farm.

stairs sleeping room. The nest box is at one end of the upper floor. You will note that a 12x12 opening ismade in the end of the box and this is covered with muslin for ventilation. You can also see the two doors that are made in the front of the house so the doors can be lifted and both upper and lower floors easily cleaned. This makes a splendid little house for a small flock on a city lot. A small pen of Standard-bred chickens can be kept in such a house and be as snug as "a bug in a rug." There is a very small outlay required to begin poultry keeping in this way.

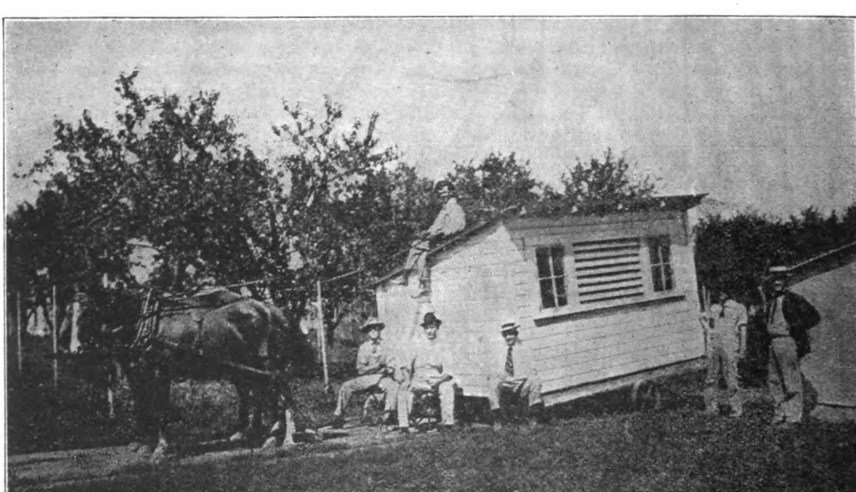


Fig. 97

Fig. 96. A great labor saving vehicle is a wagon built close to the ground for the carrying of feed and water. If you expect to rear your fowls on the range in large numbers you will find this is a very useful vehicle. The barrel has a hose attached to it and the water fountains can be easily filled by one man while the other is filling the feed hoppers. It was found by actual count that this could be done in less than one hour's time per day when about twenty-five hundred chickens were being fed. A wagon bed can be placed on it for hauling the droppings to the fields and for carrying straw to fill the houses. Fig. 96 is furnished us through the courtesy of Cornell University.

Fig. 97 is a truck used in moving poultry houses, coops or such equipment on poultry farms. This shows a large house 8x12 feet that is on the truck and now being moved. In order to load the house, you simply raise one end with a large jack screw and the truck or moving wagon is backed underneath the house just far enough so that when the jack screw is removed the house will come down into position as shown. We have known where 20 or 30 such houses have been moved in one day by two men and a team without injuring a single house in the least. The house can be jacked up again the same way and the truck pulled out from beneath and the house allowed to settle into position.

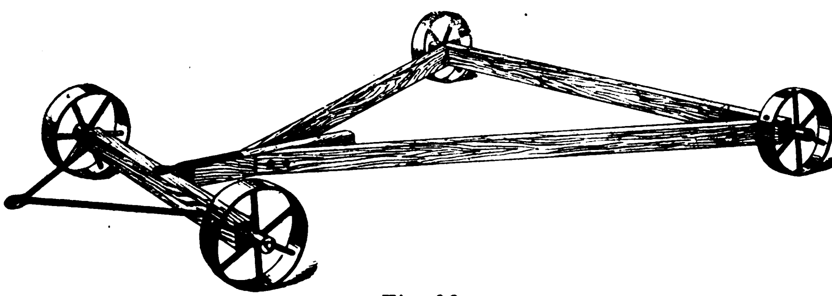


Fig. 98

Figure 98 shows this same moving truck which can be built by any ordinary blacksmith or wagon maker. Four wheels should be used and the wheels should be just as low or just as small in diameter as you can get them. Twelve or fifteen inches is the best height and the face of the wheel should be rather wide so as to prevent the truck from sinking in the soil or mud. The wheels shown in the above illustration were taken from a long tongued hay rake. The framing material should be made of 4x6 or 4x8's. The axle should be made of metal and heavy enough to support a large or heavy house. The frame proper is built in the shape of a V and it comes to a point about 2 feet back against the frame so a very short turn can be made if necessary. The distance from the front to the rear axle should not be less than 8 feet. The rear axle should be 9 feet in length so as to permit an 8-foot house to rest on the frane and between the two wheels. The top of the frame should really be an inch or two higher than the wheels if possible to so construct it. It is not necessary to have the front axle more than 4 feet in length. Two rods should extend out from the front axles and be welded together with a ring as shown in the illustration so that a clevis and double-tree can be easily fastened to same.

A small bed can also be made to place on this wagon so that it may be used in hauling other things as well as poultry houses. An arrangement of this sort will be found very useful on a large poultry farm if colony houses are to be moved each season.

Fig. 99

Figure 99 is a box that is used to preserve the droppings on the farm of the American Poultry School. These boxes are 3 feet in width and 3 feet high. The bottom of the boxes and the rear ends are solid. One side of the cover is made solid but the opposite side is hinged so that the lid may be lifted and the box filled or the droppings easily removed. The boards in the front side of the box slip into a groove so that these may be removed, one after the other when shoveling the droppings from the box to a farm wagon. If you wish to preserve the droppings for fertilizer, it is best to use a layer of droppings and then a layer of soil. You will note the galvanized iron container in the hand of the attendant. This is used to catch the droppings as they are scraped from the droppings boards.

It is our custom to have one of these large boxes at the end of each large poultry house or convenient to several houses. This protects the droppings from the rain and weather and preserves them for future use. The boxes are built on 2x4 runners so they can be moved about the farm.

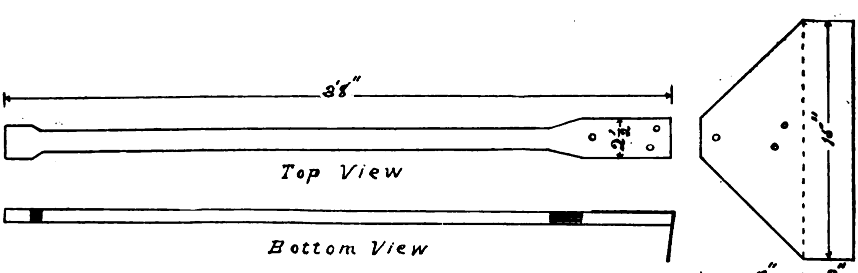


Fig. 100

Fig. 100 shows a home-made droppings board scraper. It is constructed from a sheet of 17 gauge galvanized iron, size 8x15 inches and

shaped as shown in the illustration. Cut the sheet of galvanized iron as shown in the drawing. It is also necessary to have there 1¼ stove bolts and a piece of 3-inch wide pine or the very lightest lumber obtainable. The lumber is used for a handle and should be turned and rounded so as to fit the hand. The shape of the scraper allows it to fit close into the corners and it is also very light and convenient to carry from pen to pen. If you use large houses and they are of considerable distance apart, it would be a good idea to have one of these scrapers in each house. In cleaning wide droppings boards in large houses, it might be necessary to have the handle nearly 4 feet long, but in smaller houses it would be more convenient if the handle is shorter. A common bushel basket may be used in connection with this implement, if you do not wish to go to the expense and trouble of having a galvanized iron container made like that shown in Figure 99.

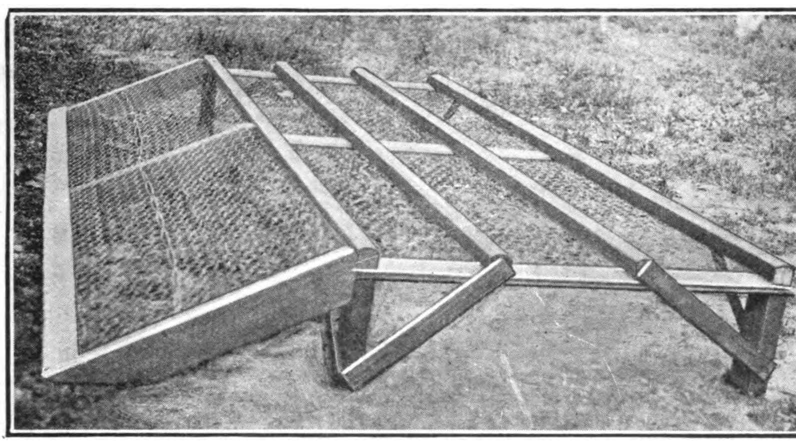


Fig. 100-A

Fig. 100A represents a very important device which should be used by every poultryman about the time that he takes the heat away from his young chicks and wants them to learn to roost. If the chicks are allowed to roost on the floor after they reach a certain age, they crowd and the weaker ones are trampled on, and often die by the wholesale. Colds and roup and other diseases sometimes follow. However, if every poultryman will build temporary roost poles like this and cover the runway up to the roosts and the underneath side of the poles with one-inch poultry netting, the chicks will soon find their way to the roots, and will take delight in roosting there, the proper distance apart, instead of crowding and dying in the corners upon the floor. These poles must me made just to fit the end of the house where you want the chicks to roost, so the chicks cannot drop down between the roosts and the house. Make them about a foot or eighteen inches from the floor and with a slanting runway to the first pole. The underneath side of the whole thing must be covered with a wire. This also protects the chicks from the droppings. They simply pass through the wire to the floor then dry up and are more easily cleaned from the floor than where the chicks have trampled in them. Even if the chicks should crowd on the wire and on these temporary roosts and the weaker ones are underneath, they can still breathe and will not smother as they often do, for the reason that the wire below them permits them to breathe from below, even though other chicks may have them covered from above.

But you will find that the chicks soon take to these temporary roosts. This insures plenty of roosting room for each bird, they grow rapidly, and

their plumage is kept clean and they keep in good health at a very critical time. No time is so dangerous as when you take the heat away and are trying to teach the chicks to go to roost. This temporary roosting device solves that problem.

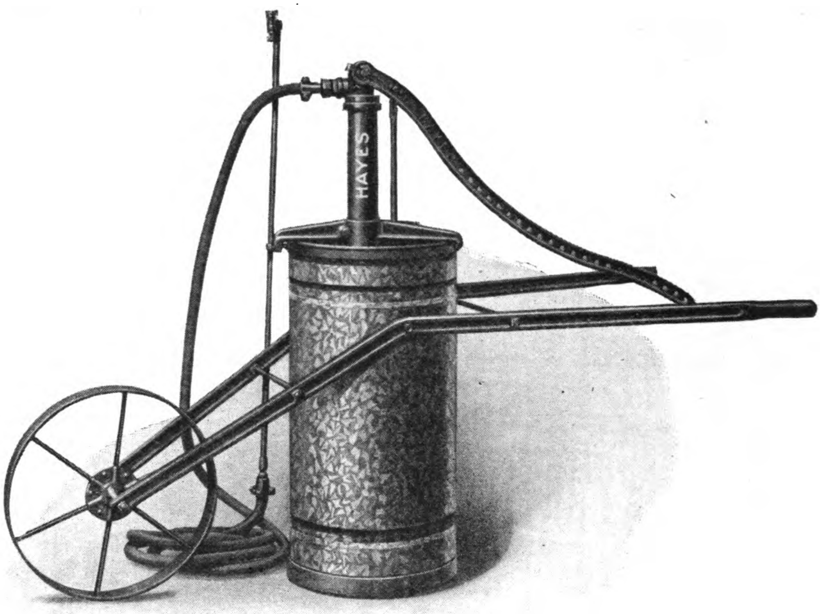


Fig. 101

Figure 101 is a handy portable wheelbarrow sprayer. It is especially designed for whitewashing, disinfecting and various kinds of spray work. It can be easily moved anywhere like a wheelbarrow, through narrow openings and between narrow crop rows.

The spray pump is easy working and powerful. One hundred and fifty to two hundred and fifty pounds of pressure can be had with no great amount of effort. The frame is made of steel. The tank has a capacity of 12½ gallons and is made of galvanized iron. A hose one-half inch in diameter and twelve and one-half feet in length goes with each spray pump. There is also an 8-foot extension rod furnished with each machine. This sprayer is made by the Hayes Power and Pump Co., of Galva, Ill.

Figure 102 illustrates a Portable Spray pump, whitewasher and disinfecting machine. This sprayer is large enough for spraying, whitewashing and disinfecting poultry buildings and can be used as well by truck farmers and fruit growers. The tank is made of heavy galvanized iron and has a capacity of 12½ gallons. The frame is made of gas pipe. A lock holds the tank in an upright position and prevents the wasting of spray mixtures. The pump is of substantial make and has a mechanical agitator in the bottom of the tank.

This is a labor saving machine and no poultry farm can well afford to do without a sprayer similar to the above in construction. This spray machine is sold by the Ripley Manufacturing Company, of Grafton, Ill., and is sold under guarantee of satisfaction or money refunded. Each farmer should also have a small hand sprayer for spraying the birds and for lighter work.

Figure 103 illustrates a handy coop for breaking up broody hens. It is nothing more or less than a square box with slatted sides and slatted

Fig. 102

bottom. A door should be made at the top so that the hens can be put in or taken out at will. The coop is then swung from the limb of a tree or the ceiling of a poultry house. There should be a trough used on one side of the coop so that the hens may be watered and fed from same. Small chains or rope may be used with which to suspend the coop. We prefer the coops illustrated in Fig. 104 if you have a very large flock of birds. The outdoor coops are really preferable to a coop of this style.

Figure 104 is a row of Broody hen coops. Many of these coops are used by the American Poultry School and they usually return a hen to her laying yard in four days, ready for business. By experiments it has been learned that each day's delay in penning a broody hen means a rapidly increasing number of days in effecting a "cure." It rests with the poultry keeper to prevent her being a slacker in production and to keep her from spoiling the product of other hens.

Broody hens are the cause of billions of spoiled eggs going to market every spring and summer. Egg buyers and packers know this and realizing that they must be candled out, are, therefore, forced to consider this great waste when determining prices to be paid producers. Millions of dollars are lost annually on acocunt of neglect in handling hens properly, immediately after they go broody.

Broody hens and their improper care are the causes of a loss in annual egg production of millions of eggs, for it has been shown that by breaking up broody hens promptly, you can increase the egg yield of the average hen from 15 to 25 eggs per hen per year.

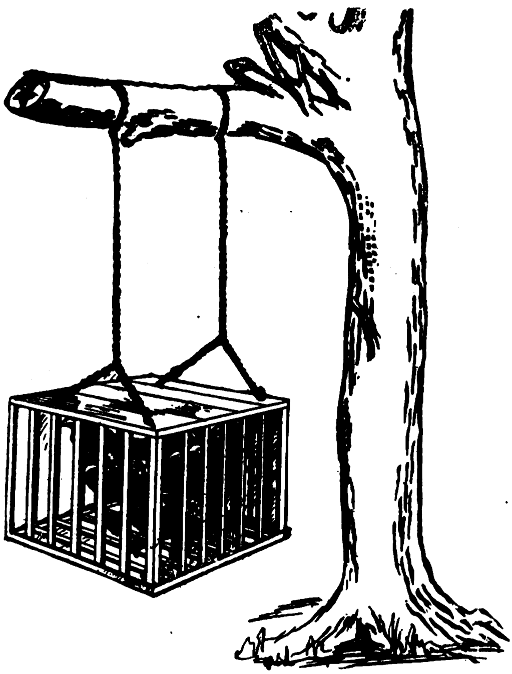


Fig. 103.

The enormous loss from spoiled eggs, traceable to broody hens, and the loss in egg production caused by a lack of proper methods in caring for broody hens, in indeed a serious problem—a problem, however, that poultry raisers can easily overcome. Will they do it?

Fig. 104.

WHY WE SHOULD CHECK BROODINESS AT ONCE

There is an idea general among poultry raisers that when a hen begins to lay she has a certain number of eggs to produce after which she is very likely to go broody. This supposition has been proved to be wrong. Every hen's ovary contains many times as many eggs as she ever lays, and egg production continues according to the physical make-up of the hen as provided by nature, unless she is interrupted from laying by broodiness or some outside influence, such as becoming frightened, being moved, weather conditions or improper care and feed.

Investigations have proved, beyond a doubt, that broodiness is a condition of the brain and not of the body. Of course, the condition of the brain naturally acts upon and influences or controls the body. Every hen, when she goes broody, is in a laying condition, having the different parts of the eggs developed, but because of staying on the nest, lack of exercise, loss of appetite and lack of nourishment, she takes these partly formed eggs back into her system and uses them as nourishment for her own body.

Hens remaining on the nest all day in a broody condition will very often have other hens lay in the same nest. If the eggs are fertile, embryo or germ development takes place in these eggs as a result of having been set on. The eggs, when gathered later in the day, are usually placed where the temperature is too cool for incubation to continue, thus causing the embryo to die, resulting in a small speck of dead matter within the shell. This is so small at first that one almost needs a miscroscope to see it, but within a short time the egg is spoiled. It has become rotten, as the small speck of dead matter quickly contaminates the entire egg. This results in billions of spoiled eggs going to market each year.

Some time ago professors carried on a series of experiments to determine what influence broodiness had upon egg production. Among several important things of a practical value to all poultrymen, which they proved, was that the average hen, if allowed to remain broody one day and then placed four days in a coop for breaking up broody hens, would not lay for ten days from date of going broody, the average hen, if allowed to remain broody twenty-one days and then broken up, lost thirty-five days before laying an egg and often they will remain dormant for two or three months.

When we consider these facts, together with the reckless, haphazard fashion of caring for broody hens employed by most poultry raisers, it is then plainly seen that millions of eggs are annually lost which could easily have been profitably produced and preserved, if correct methods were used.

Broodiness is a condition of the hen's mind and, if encouraged, it becomes an inborn part of the nature of her offspring. The disposition of broodiness is a hindrance to a high egg yield. Some of our very best laying hens go broody many times during a year, but they are broken up immediately. It is important that we breed this disposition out of the hen as much as possible. The first step in that direction is always to discourage broodiness by breaking the hen of the idea at once. We never permit a broody hen to remain on the nest over night.

Hens should never be used as sitters in early spring. These early sitters have been egg producers during the winter, and every good egg from such hens should be incubated, provided, of course, that they are of good quality and Standard-bred.

The old time-worn methods of placing a broody hen in a tub of water, or tying a red rag to her tail, etc., are out of date, decidedly inhuman, and very injurious to the hen's health, and her chances of again becoming a good egg producer or strong breeder are materially lessened.

HOW TO "BREAK UP" BROODY HENS

At the American Poultry Experiment Station, we use a coop (shown in photographs published herewith) for breaking broody hens from the idea of broodiness. Such coops can be easily and cheaply made by anyone. The average poultryman or farmer usually has enough lumber scraps

or old boards about to make two to four of these coops without going to the expense of new lumber. They can be made in different sizes, but for general use and handiness, we prefer those of the following dimensions: Corner posts or legs of 2x4 stock, cut four feet long and said coop is made of 1x1½-inch strips, set two inches apart the long way of the coop. The floor of the coop proper is thirty inches from the ground, thus making the coop proper eighteen inches high on the sides. A gable roof is placed over all, the distance from floor of coop to the point of gable being twenty-four inches. The roof extends six inches over both ends and sides, furnishing additional protection from sun and rain. The floor of the coop is made of 1x1½-inch strips, set two inches apart the long way of the coop, first having the edges slightly rounded. One side of the coop where the feed trough goes is made of lath or slats placed two inches apart and nailed to the top and bottom of the coop so the hens can eat through the slats. The other side and ends may be covered with the same kind of slats or with ordinary poultry netting. A slatted door, 12x18 inches, is hinged to one end of the coop. A wooden trough four inches wide and five inches deep is placed level with the floor along one or both sides of the coop. A small partition is placed four inches from each end of this trough into which is placed an ordinary tomato can for water. The roof of the coop is covered with some good roofing material.

We follow the plan of using four of these coops. All broody hens found in the nests in the evening are placed in one of these coops. The broody hens the next evening are placed in another coop, and so on for four consecutive days. By the fourth evening we have one or more hens, as a rule, in each of the four coops. The following morning the hens from the first coop are removed and placed in their yards and in the evening that coop is again filled with a new lot of "broodies."

The hens in the "broody coop" are fed and watered regularly each day. The feed is supplied in the troughs. The same grains, mashes and green foods which are supplied to the hens in the laying pens are furnished the broody hens.

Fig. 105.

Being confined to these slatted coops with an abundance of fresh air under and about them, and with nothing to do but watch the other hens enjoying the freedom of nearby yards, soon takes the idea of broodiness from the hens so inclined.

In most cases it would be well to annoint each hen with some louse ointment before placing her back in the yard. A small amount should be rubbed well into the skin about an inch below the vent and also on each hip. Thus you will prevent these troublesome pests from getting a start in your place.

Figure 105 is a close-up view of the coop for broody hens. You will note the solid board door in the left end and wire in the opposite end and in the side next to you. On the opposite side, where the feed troughs are, it is necessary to have slats so the hens may get their heads through same

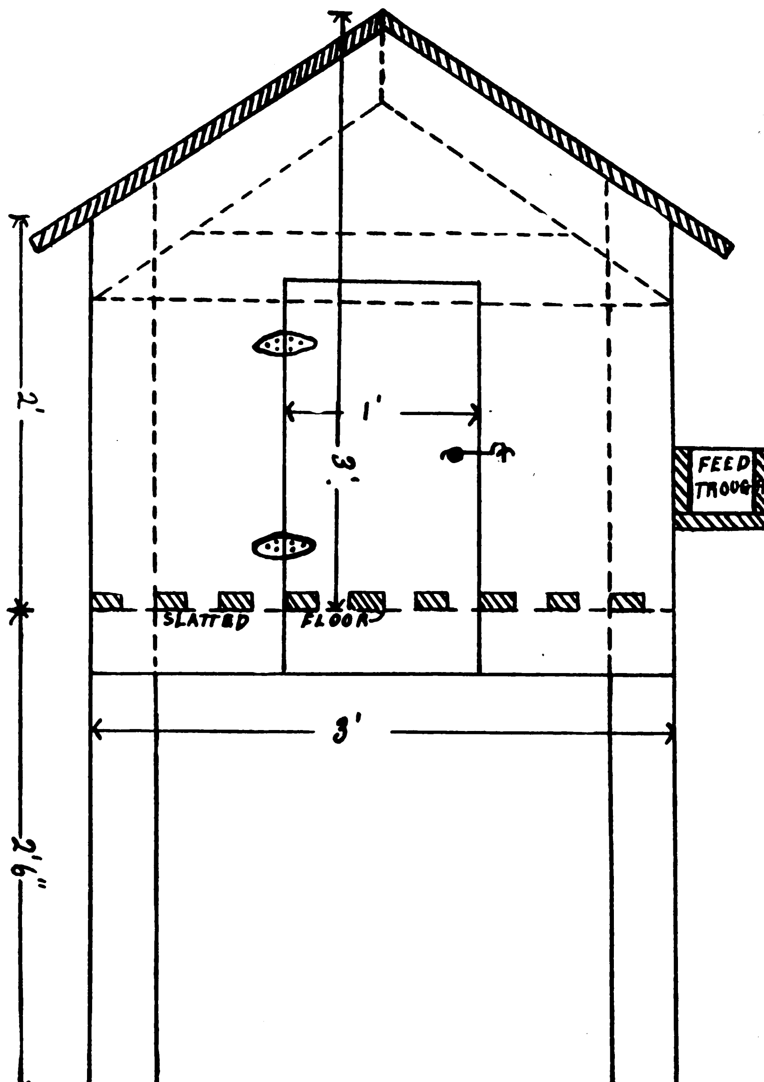


Fig. 106.

in order to have access to the feed and water which are on the outside of the coop.

Figure 106 is a detail drawing of the end of the broody coop which contains the door. When the weather is not too severe, it is much better to place broody hens in the yard than in a coop in the hen house. During the broody season mites and lice are apt to infest the houses. Figure 106 is the plan for making this coop. Two by fours can be used for the posts, one-by-two strips can be used for the flooring, and it is possible to use small strips to enclose the sides, or poultry wire can be used. The feed trough should be made in front of the coop so that the birds can be kept in condition and not starved, as many think is necessary to do, to hasten them back into laying condition. The height and width are indicated in the plan. The length of the rafters is twenty-three inches.

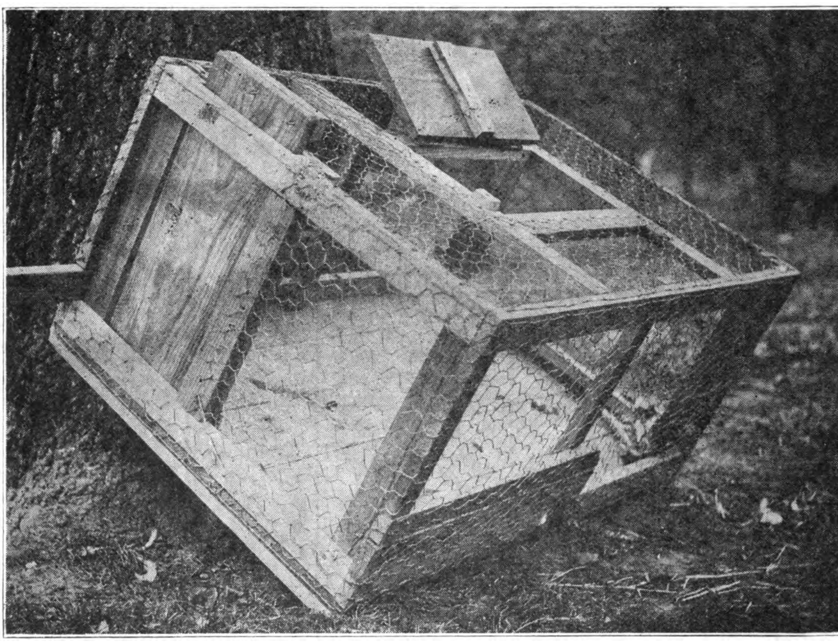


Fig. 107.

Figure 107 illustrates a home-made catching coop which is a very useful and necessary appliance on any poultry farm where many chickens are kept. This permits you to place the coop up near an exit of a poultry house and permits the chickens to pass from the house proper into the coop without being frightened, injured or bruised by rough handling. After the coop is filled, the door in the end may be slipped into position behind the birds. Then the coop may be removed and the chicks lifted through the door in the top of the coop. This is a splendid device that is quite useful when you need to catch chickens at sorting time, when you are culling them for market, selecting or mating them for breeding purposes, or when you wish to catch the chicks to treat them for body lice. Or if you wish to move the chicks from one house to another, this is a splendid device for that purpose.

You can make the coop any size you wish, but a coop 4 feet long, 1½ feet high and 2½ feet wide is a convenient size.

A CATCHING HOOK

Figure 108. We should be as gentle with our flocks as possible, and frighten them no more than absolutely necessary. Every farmer and poul-

tryman should have several catching hooks about the farm. They save time in catching your poultry, and often prevent injury to the bird by fright. Take an ordinary broom handle or light piece of wood and make a handle and attach a 3-foot piece of No. 10 steel wire to it. Bend it to the proper shape, as shown in the accompanying illustration. It makes

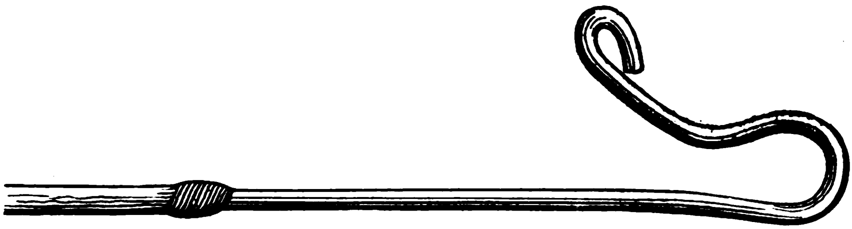


Fig. 108.

it much better and more rigid if you reinforce the main wire by winding a second wire of like size around the main wire for a foot or more from where it is attached to the handle. You can bend and thus increase or diminish the size of the hook to correspond with the size of the fowl's leg which you are attempting to catch. Slip the hook quietly down toward the fowl, and quickly reach it around the shank just above the foot, and the fowl can then be gently drawn towards you and its feet released. Be careful not to injure its leg.

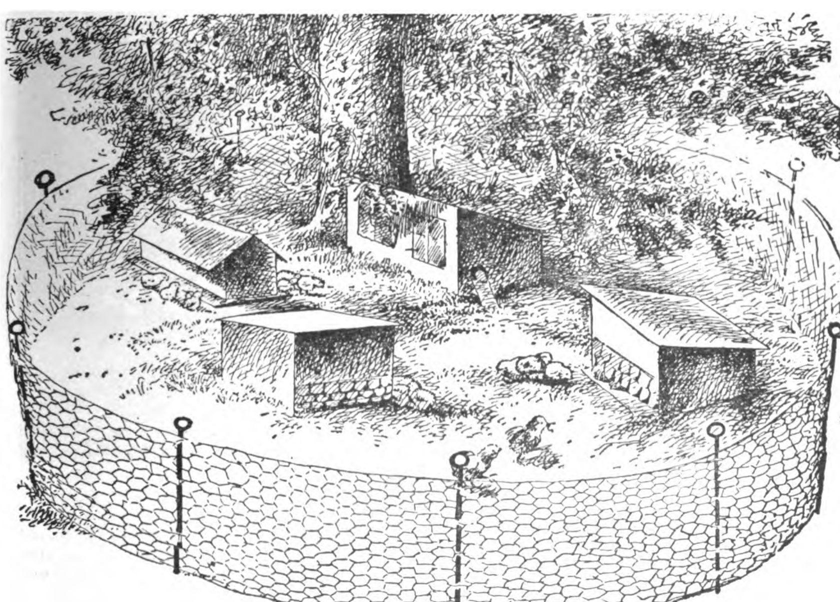


Fig. 109.

Figure 109 is one of the best yarding arrangements for baby chicks that we have ever used. We use 1-inch poultry netting that is 2 feet in height. We have our blacksmith make a few small iron rods with a ring at the top and pointed on the other end, which is forced into the ground. These rods are worked through the poultry netting and then forced into the ground, which holds the fence close to the earth and also makes it rigid, holds it in position and keeps it from sagging. A poultry fence that

is no more than 2 feet in height can be stepped over by the attendant, but the chicks are kept inside until you desire to remove the fence. When that is done the wire is rolled up and the iron rods and all are rolled with it. This is stored away until needed again.

It is not always convenient nor the best plan to build permanent, substantial yards to meet temporary spring needs. Where space is limited, especially grass space, it is much better to move the chick coops about and give the grass a chance to grow and the ground to freshen, for the chicks eat down the grass. For a movable fence, there is nothing that we have seen so cenvenient as the simple arrangement shown in Figure 109. Instead of setting posts in the ground and fastening the wire with staples, as is usually done, the fencing is held in place and upright by wire posts or pins made of one-fourth-inch material, sharpened at one end and looped at the other, thus making them easy to push into the ground and to pull up. By being woven through the mesh of the fencing, they act as posts and braces in a very satisfactory manner.

This simple fence can be quickly moved or taken down, rolled up and stored away. The chick yards can be changed in a few minutes to include more grass or can be moved to a different spot. One or several brood coops can be enclosed and the chicks are thus kept under ideal conditions at all times, so far as yarding is concerned. The fencing does not have to be cut to fit any particular pen, but can be left in the roll and all or part of it used, as desired.

Brooders or brood coops can be placed under a tree and the fence run around the tree. This makes an ideal yard for chicks and they can get, not only sunshine and shade, but the bugs and worms that are found in such places.

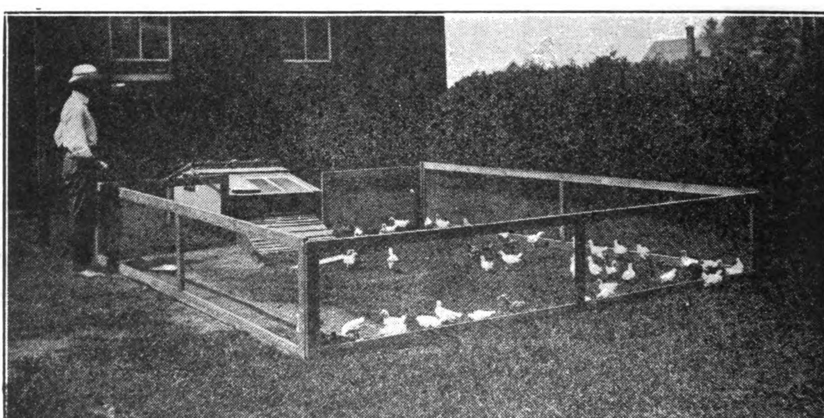


Fig. 110.

Figure 110. Strips of 1x2 material may be used from which to make temporary fences with which to surround outdoor brooders or colony houses. The fences are built in sections, 12x14 feet in length, and two, two and one-half, or three feet high. They should be built uniform so that the fencing may be transferred and moved from one place to another, and no matter which section of the fence is to be used it will fit in any yard. The corners of the fence may be held in place by nailing same or bolting together with small bolts, or the corners fastened with ordinary screw hooks and eyes.

When the small chicks are placed in a brooder, hover or colony house, for the first days they are permitted to run out on the ground, it is necessary to confine them to small pens so that they will learn their way in and out of the house or brooder. These fences are very useful for that purpose.

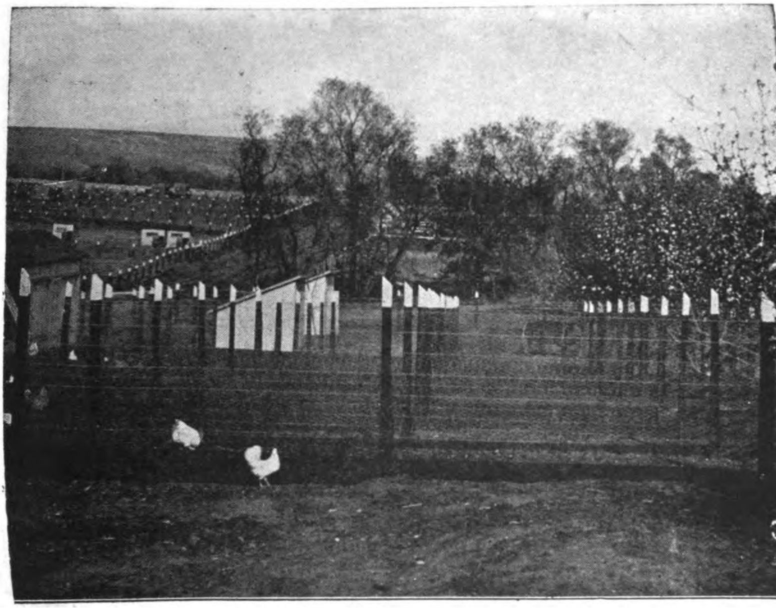


Fig. 111.

Figure 111. This is an illustration of an attractive method of fencing poultry yards. The bottom portion of the posts are painted a dark color and the top portion painted white. Some poultrymen paint the entire post white.

It is really more economical to construct your fencing in a substantial way, using what is known as poultry and rabbit fencing rather than poultry netting. Fencing of this kind makes your place more attractive and prevents your fowls from becoming mixed in the yards.

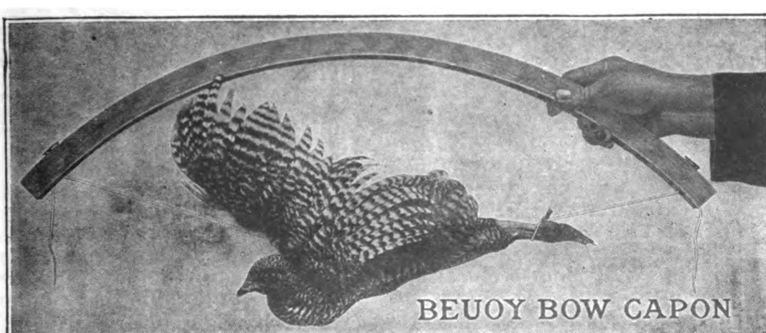


Fig. 112.

Figure 112 illustrates one of the Beuoy capon bows. This new and simple bow does away with the most objectionable feature in making capons. It completely eliminates the weight and cord used for holding and stretching the fowl. With the Beuoy bow the operator has complete control of the bird without torturing it in any way. With it a caponizer

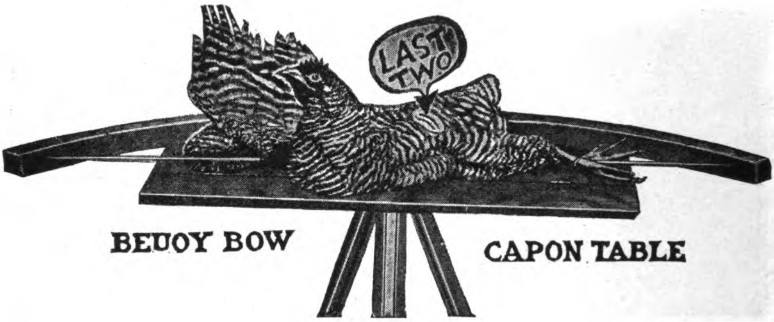


Fig. 114.

can use anything that is handy for an operating table, such as a box, barrel or stand. These bows can be purchased from the manufacturer, Geo. Beuoy, Cedar Vale, Kansas. Mr. Beuoy also manufactures one of the best sets of caponizing tools, such as we use at this institution, and also capon tables which are shown in Figure 114.

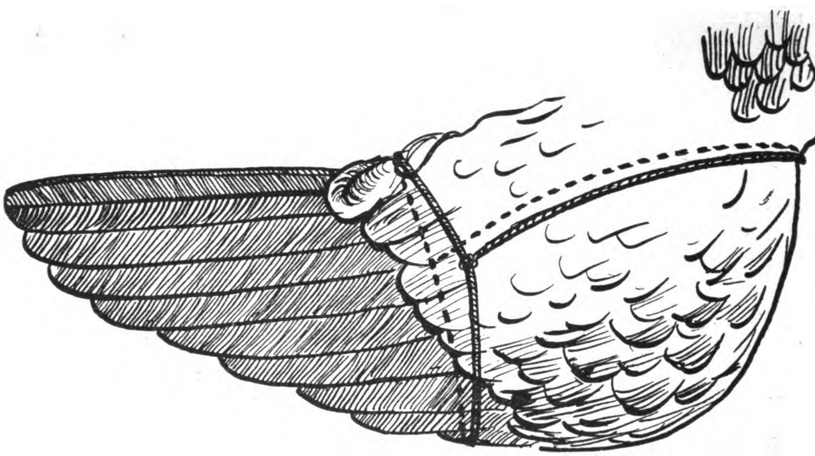


Fig. 115.

Figure 115 represents a method of preventing birds from flying, by tying a cord around a wing in the manner illustrated above. It may be necessary to tie another string up closer to the body and attach the ends of the cord to the cord that runs toward the head of the bird in order to hold this in place and prevent it from dropping off the wing. A method of fastening wing feathers together that might prove more satisfactory than this would be put a strip of adhesive plaster around the wing where the string is shown perpendicular. The plaster should go entirely around the wing and be pressed firmly against the feathers. Also see that the ends of the adhesive plaster are firmly fastened together. This method should be used only on one wing of each bird and the other wing should be left free. We would recommend the above method only in cases where you wish to prevent the birds from flying and yet avoid clipping the wing which would disqualify it for exhibition purposes.

Figure 116 illustrates our method of clipping wings of poultry to prevent them from flying. Only one wing of each bird is clipped and only the flight feathers in any case are clipped. The wing is cut as shown in

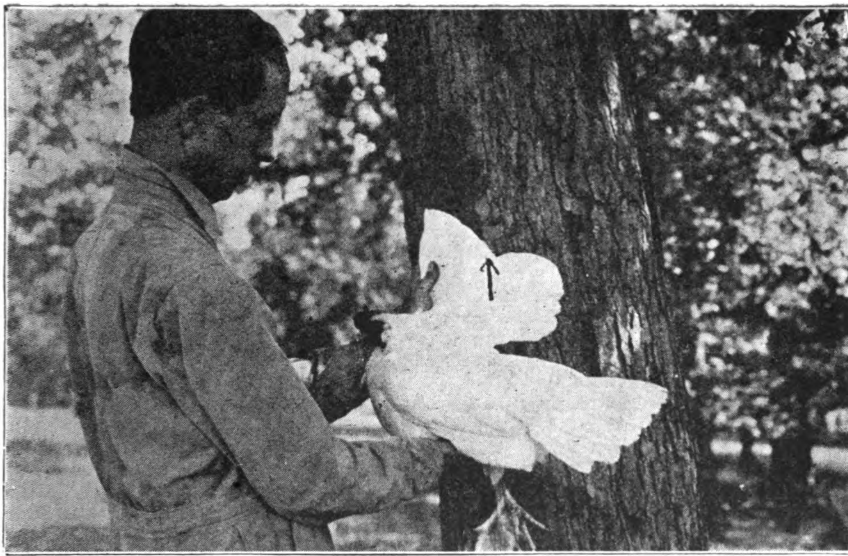


Fig. 116.

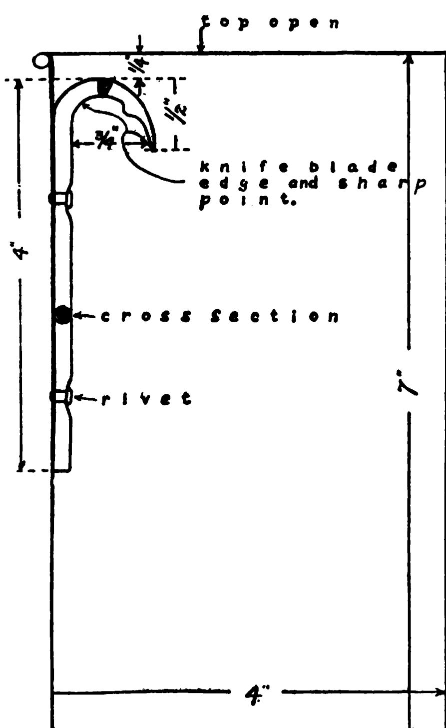
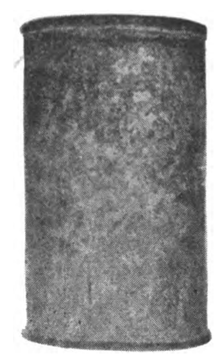


Fig. 117.



Blood can for use in killing poultry.

the above illustration. The half of the wing feathers furthest from the body are the only ones to be cut. The wing on the opposite side of the bird is not disturbed and in that case, when it attempts to fly, it is unbalanced and falls to one side. By clipping the wing in this way, when it is folded by the bird, the clipped portion is folded underneath the one-half of the wing feathers which are not clipped and, therefore, does not mar the appearance of the fowl. Baby chicks which are inclined to be weak, also droop their long flight feathers and if one-half of each wing is clipped in the same manner, you will find it will make a wonderful difference in their appearance and they also seem to do better and gain in strength.

Figure 117. Here we show a "blood can" for use in killing and picking poultry. The best method of killing fowls for the market is by "sticking" them through the mouth. In this way the head is left on so that the buyer may tell the sex as well as gain other points indicated by the head to those who know fowls; and, besides, the birds are well bled. It is necessary to kill in this manner in dry picking the birds, in order to loosen the feathers. The fowls are hung up by the feet with the breast toward the operator. The simple way of suspending the bird is by hanging a stout cord, with a cork or circular block of wood three-fourths of an inch thick by one inch wide, fastened to the free end, from a beam just above the head of the operator. Then the fowl is held head downward with both feet together and the cord twisted around the shanks and caught with the block of wood. The fowl's head is held in the left hand and the "stick" made with the right, after which the "blood can" is hooked into the fleshy part of the lower mandible from the outside. Inside the can is a sharp hook to be hooked in the lower jaw as shown.

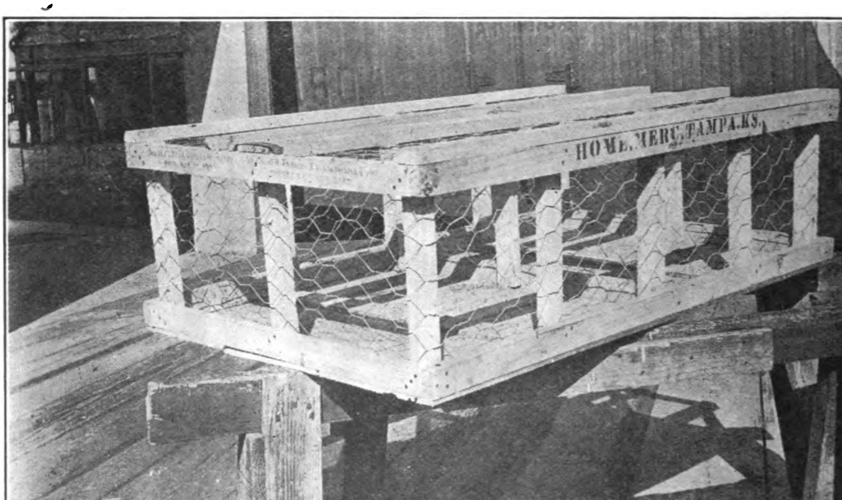


Fig. 119.

Figure 119 is a home-made shipping crate for market poultry. This crate should be built about 2½ feet in width and not over a foot or 15 inches in height. The corner posts should be made of 2x2 material and the remainder of the upright material made of 1x2. A light, yet durable netting can be tacked around the sides and ends of the coop. There should be a movable slat through the center of the coop about 4 inches in width so that the fowls can be placed in the coop or removed at that point. The remainder of the top should be made of narrow and light weight strips so as to prevent the fowls from escaping. The strips should be close enough together to prevent the fowls from getting their heads through same. It is dangerous for them to stick their heads out of the coop, because in rapid process of loading and reloading a large number of fowls in shipping

coops, one coop will be placed on top of the other, and if the birds are permitted to have their heads on the outside, there is danger of many of them being killed.

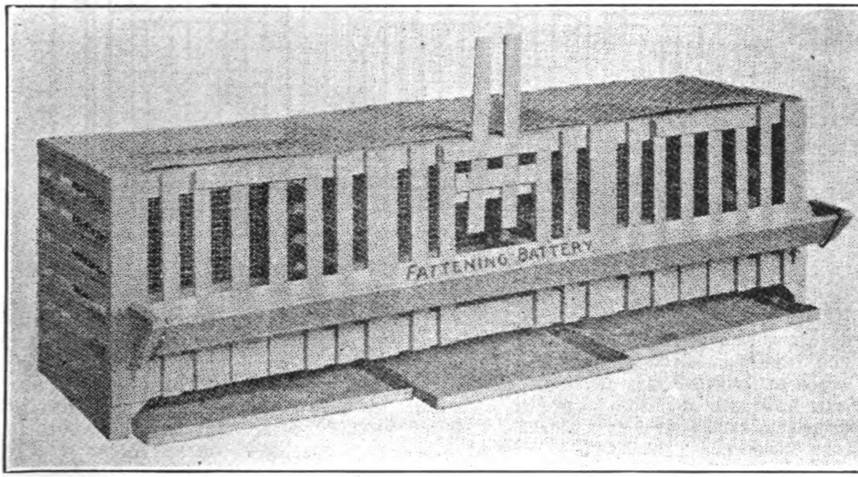


Fig. 120.

Figure 120 is a crate used for fattening poultry. We make this crate 6 feet long, 20 inches wide and 20 inches high. There are partitions run every two feet, which makes three pens. The frame is made of one by two-inch material, and the top, back and ends are covered with one-inch mesh poultry netting, while the floor is one-inch mesh netting, which is made of Number 9 wire. The wire floor enables the droppings to pass through to galvanized pans which have been placed underneath, thus keeping the chickens and pens in sanitary condition. The two center laths of each pen are fixed so they can slide up and down and thus serve as doors. About eight inches from the bottom of the coop, in the front, a V-shaped trough is hung, and the birds are fed from this trough. The crate will hold from fifteen to twenty-five birds, depending on size and age, each compartment holding from 5 to 8 chickens. The crate should be placed where it will have plenty of light and fresh air. Figure 121 is a drawing of this crate. The galvanized pans are 1x23x24 inches in size, or just large enough so they fit snugly into the space below the bottom of the crate.

The most satisfactory method of finishing chicks for market is to confine them to small crates where exercise will be restricted, and feed them heavily for ten days or two weeks on a wet, sloppy mash made with milk.

The advantages of the crate method of feeding over all other methods are that it is more sanitary, the fowls are more easily controlled, feeding is easier and greater gains are secured. In addition, it is easier to avoid disease since every chicken fed is under individual observation.

To market chickens which have not been properly conditioned through some method of fattening is an economic waste. Chickens will not reach their maximum development of flesh without special feeding. The farmer who sells his chickens without fattening them deprives himself of a large part of his possible profit, since the increased weight produced by an efficient method of fattening is produced at a low cost. The unfattened chicken loses a much greater percentage of its weight in dressing than the chicken which has been properly fed.

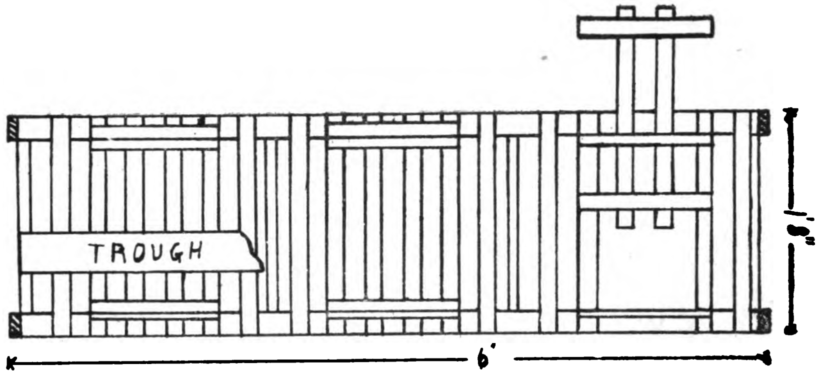


Fig. 121.

Figure 121. This shows the front of the fattening crate as drawn in detail. You will note that this drawing only represents a height of eighteen inches. However, we believe it is much better to have the fattening crate at least twenty inches high so as to use it for the larger fowls. You will note the position of the trough and the arrangement made for sliding doors.

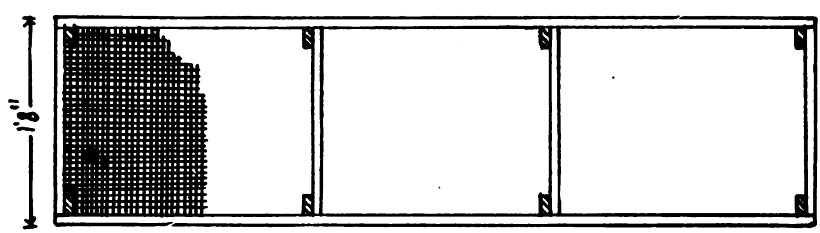


Fig. 122.

Figure 122 is a floor plan of the fattening crate described above. This will give you an idea as to how the framework is put together. The bottom of the coop is covered with one-inch poultry netting and the top is also covered with netting. The same is true of the back, the front being the only portion which is slatted. The laths in front should be about two inches apart. The framework should be made of 1-inch by 2-inch strips. Divide the coop into three pens, each two feet in length. Make a long wooden trough for the front in which to feed the soft mash, which is used for fattening. A fattening crate of this kind is cheaply and easily constructed and is a necessity on every farm.

Figure 123 represents a cooling board for dressed poultry. After the poultry has been killed and picked, it should be thoroughly cooled before the birds are placed in boxes for shipment. It has also been the practice of some packers to use these poles for shaping fowls after being picked. You will note the weights placed on the back of each bird. This has a tendency to broaden the breast and make the bird have a more plump appearance.

Figure 124 is a fattening battery which is home-made and is used by some of the large fattening stations. The crates are built about 2½ or 3 feet wide and about 3 feet in length and have a partition through the center. They are built in tiers of three, all being built, however, on the same framework, and large castors are placed under the four corners so

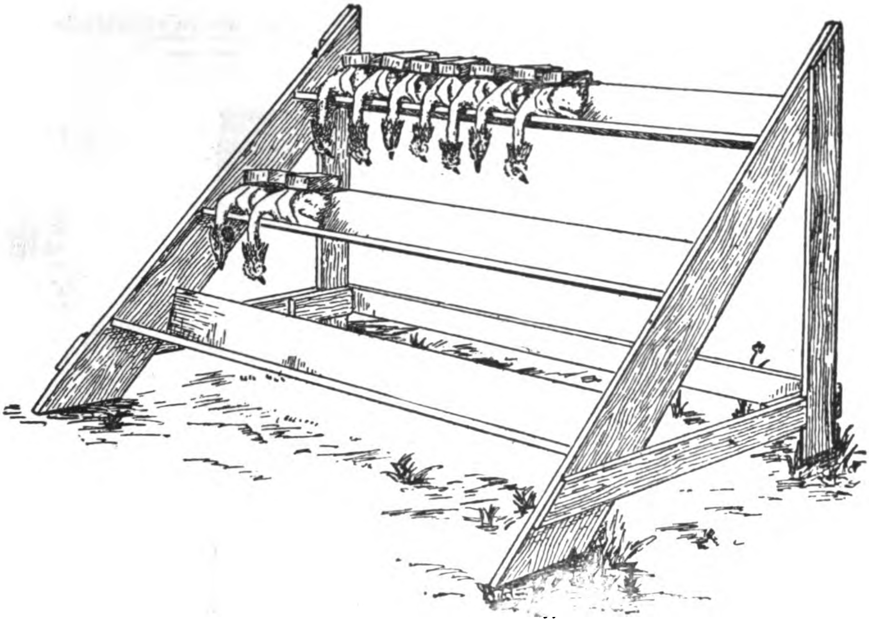


Fig. 123.

the fattening crates can be easily moved about the building. As the birds are taken from the farm or the shipping crates, they are placed in these batteries and then if it becomes necessary to move the birds about the fattening station or to take them to the killing and packing room when they are ready for market, the battery is simply rolled from one place to another and the birds are not disturbed, which prevents fright, loss of flesh and bruises.

You will note the troughs in front of each section. A long row of these batteries may be placed side by side, so the birds may be fed the fattening food. You will find these described further in our lesson on Market Poultry. Where only a few birds are to be fattened, a fattening crate such as is shown in Figure 120 will, perhaps, be better. These large

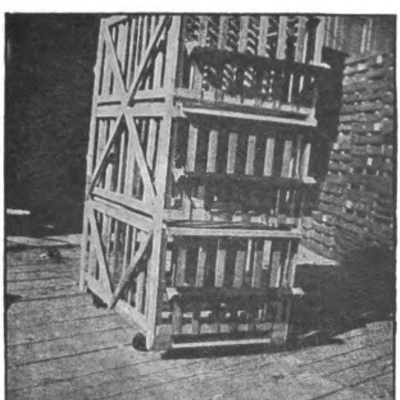


Fig. 124.

batteries are intended for use in fattening stations where thousands of birds are to be handled in the course of a year.

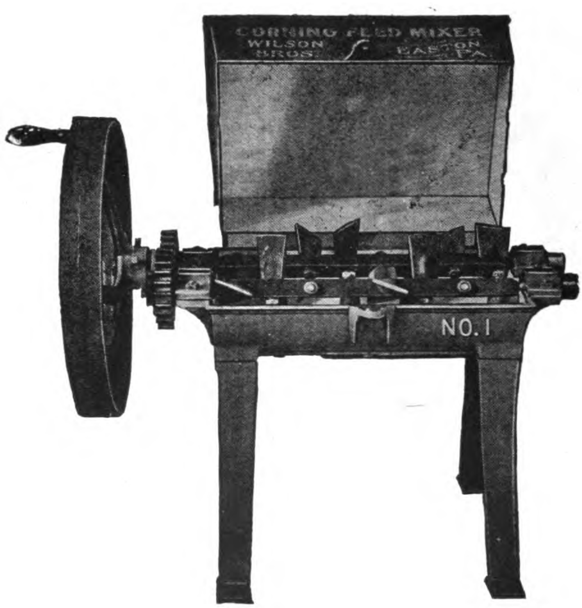


Fig. 125.

Figure 125 is a feed mixer, sold by Wilson Bros., of Easton, Pa. A feed mixer of some sort is necessary on any poultry farm. If you cannot afford to use a machine, hand or power, then it is advisable to make a square box about 12 or 14 feet square. If you use one room for a feed room, you can simply take four boards, 12 feet long, and nail the corners together and see that this fits tight on the floor. Locate this box for mixing where you wish to use it, and then the feed is measured into the box and is mixed by turning the feed over with a scoop or shovel the same as is done in mixing sand, gravel and cement for concrete work. By turning the feed over two or three times in this way, it is rapidly and easily mixed. It can then be sacked and delivered to the various poultry houses. The mixer illustrated above is a hand machine that is large enough for the average poultryman. If you have several thousand chickens to feed, it might be best to purchase one of the large power mixers sold by this company, which may be operated by electric motor or a small gas engine.

BONE GRINDER

Figure 126 is a bone grinder made for the purpose of grinding green bones as food for poultry. This mill grinds the bones so they may be consumed by the fowls. This cuts down on the amount of beef scraps or meat food that has to be used, but green bone should be fed in very sparing quantities to avoid cases of diarrhea. Grinding bones with any sort of a mill is not a "lazy man's" job, and it is sometimes better to boil the bones and use the soup with which to moisten the mash rather than to grind them as shown in this illustration. This mill is sold by Wilson Bros., Easton, Pa. There are other makes of bone grinders on the market, but we do not advise purchasing a bone grinder unless you have power of some sort with which to operate same.

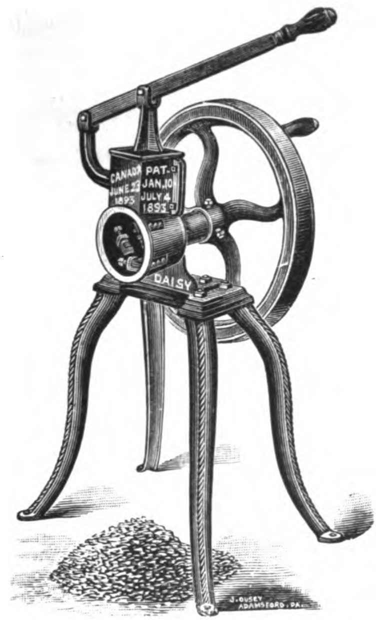


Fig. 126.

FEED AND CLOVER CUTTERS

Fig. 127.

Figure 127 is a clover, alfalfa, feed or root cutter, manufactured and sold by Wilson Bros., Easton, Pa. A machine of this sort is quite beneficial in cutting straw for a litter for young chicks and will often save a great deal of your feed bill, because there are more or less vegetables, roots and green food about the average farm that can be converted into succulent, tender feed if it is run through one of these mills. A root cutter

as well as a clover or alfalfa mill is quite a useful piece of machinery on the average farm.

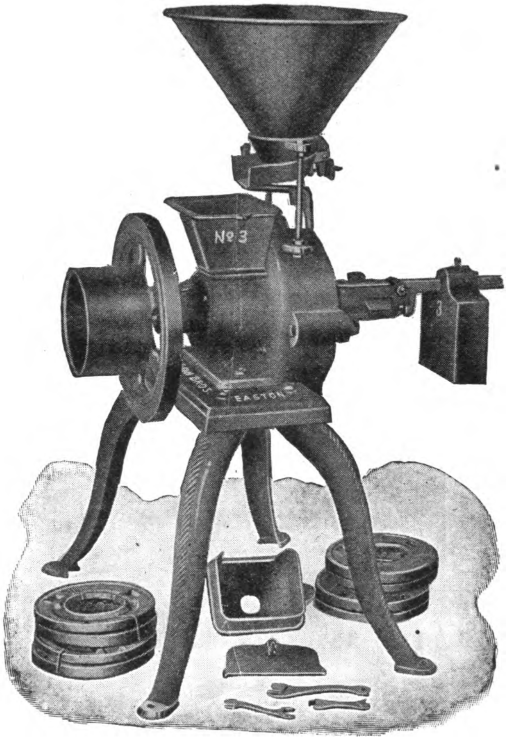


Fig. 128.

Figure 128 is a feed or grinding mill used in preparation of poultry feeds. This mill is manufactured and sold by Wilson Bros., Easton, Pa. John Deere Plow Co., of Moline, Ill., and other manufacturers, make good mills of this kind. Such a mill would have to be operated with power and would be useless without same, but quite a good deal can be saved on poultry feed where power is available and where a large quantity of feed is required during the year. Most any kind of grain can be run through this mill and ground fine, or simply cracked or made more or less coarse, depending upon the purpose for which the feed is to be used.

Figure 129. Whenever practical the doors to poultry buildings should be left open in warm weather to admit as much air as possible. Sudden storms are likely to occur, accompanied by hard winds, which will slam and play havoc with the door if it is not secured in some way. If the door swings violently with the wind it will frighten the birds, and there is also danger of breaking the door itself or the hinges on which it is swung.

We are accustomed to see sticks or pieces of lumber, logs, bricks, stones or trash propped against doors to keep them open. These contrivances are not only unsightly and careless looking, but they are troublesome. Instead of being economy they are wasteful both in the proportionate damage to the door or stock and in the loss of one's time in adjusting them.

A strong fastening may be made by driving a 2x4 oak stick into the ground and attaching the door to it by a gate hook. An improvement, however, over the idea which necessitates stooping down and hooking the

door with one's hand is shown in the sketch below. This fastening is operated by a very simple movement of the foot. The stake is made of a piece of 1x4 or 2x4 hardwood sawed at one end to facilitate driving it into the soil. The offset block should be cut from material somewhat thicker than the door to allow a satisfactory amount of play and the buttons should be cut from a piece of wood of any description as shown. A carriage bolt and a washer complete the affair, and after it is assembled, the stake may be driven into place and removed as desired. The hole in the buttons should be bored slightly larger than the bolt on which it

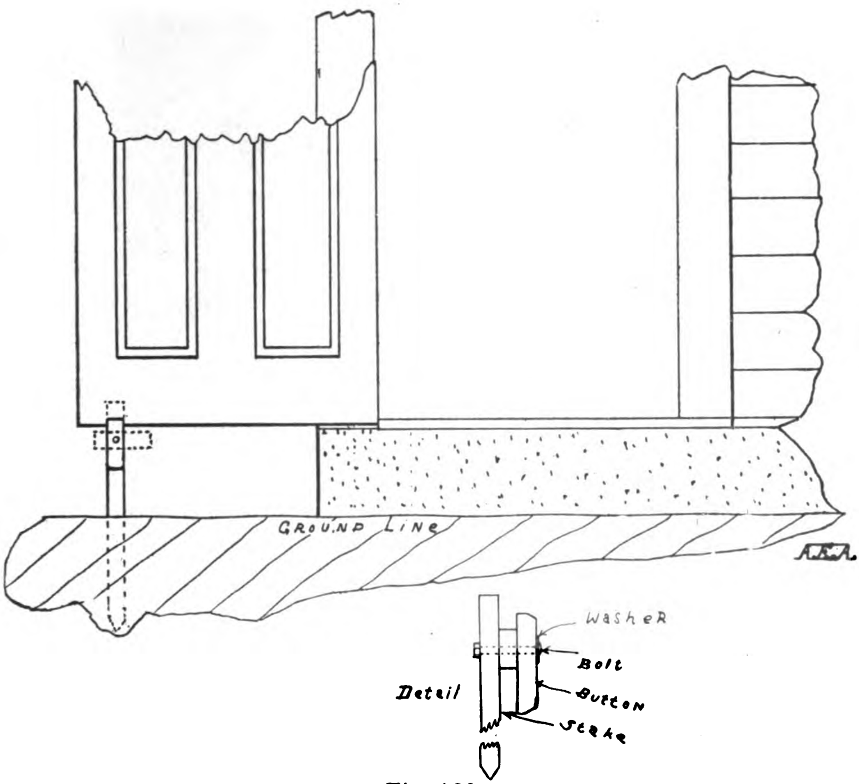


Fig. 129.

swings. The buttons should be longer at one end, therefore heavier, which will always insure an upright position. By turning the button with the toe or one's shoe to a horizontal position, the door may be secured or released. In case you should desire to use some other means of fastening the door, rather than use a button as described above, you will find that a large screw hook, the hook portion of which has been straightened out so that it forms an angle of 45 degrees, will make a very satisfactory arrangement for holding the door. The hook can be screwed into the stake so that it will fit snugly just beneath the bottom end of the door. When the door is to be released the hook can be turned downward, or when you wish to fasten the door open, the hook can be turned with the point upward.

Figure 129-A. We like to have the windows and ventilators in our poultry houses hinged at the top so that they can be opened outward as is shown in the above illustration. In order to prevent the windows from

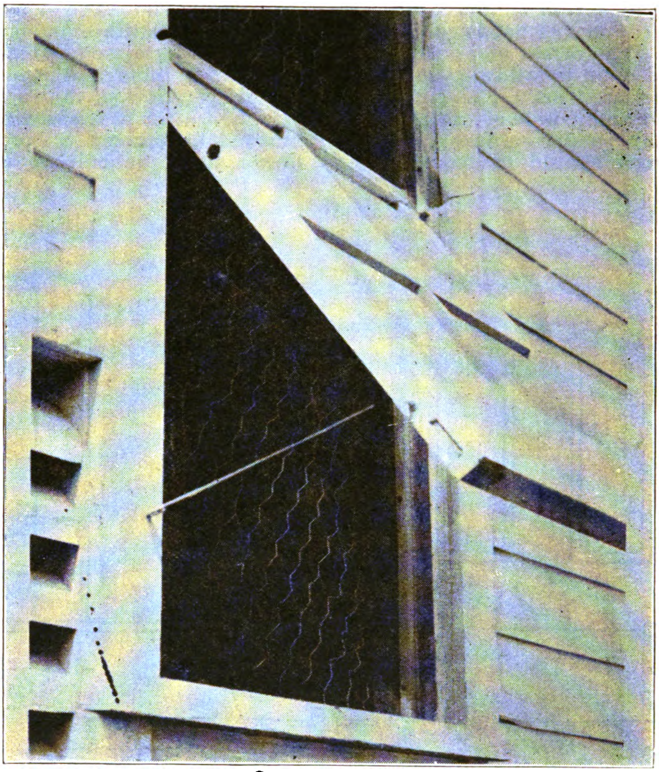


Fig. 129-A.

blowing off the hinges and being broken, it is necessary to firmly fasten them. For this purpose we use a heavy clothes line wire or a heavy, smooth fencing wire. The end of the wire next to the house is bent into a circle or ring, and into this ring is driven a large staple which fastens the wire to the house or window frame. The other end of the wire nearest the window is bent at a right angle so as to form a hook. A staple is then driven into the underneath side of the window frame and this wire or hook is fastened into the staple which holds the window in place as is shown in this illustration.

When you wish tō close the window, the wire hook can be removed and the window drawn down into position.

You will note that on the interior of the house we use one-inch poultry netting. This prevents anything from getting into the house and prevents the birds from getting out when you wish to confine them. It also prevents the birds from flying against the window lights and breaking the windows.

Figure 130. If you haven't an attendant to hold birds for you while you are preparing them for exhibition, it is sometimes advisable to use the method recommended by the Reliable Poultry Journal, which shows a convenient way to hold a bird while working on its feet, legs, taīl or head, and at the same time run no risk of injuring the bird's wings or tail feathers.

A large hammock is made as is shown in the drawing No. 1. It is made of heavy muslin, and should vary in size, according to the size

of the bird. After the bird has been placed in the hammock, the rings at each end are gathered and placed on the hook which is suspended from the ceiling of the house. This permits the bird to rest easily while you are dressing and thoroughly cleansing and polishing the legs, toes, beak, comb, face and wattles.

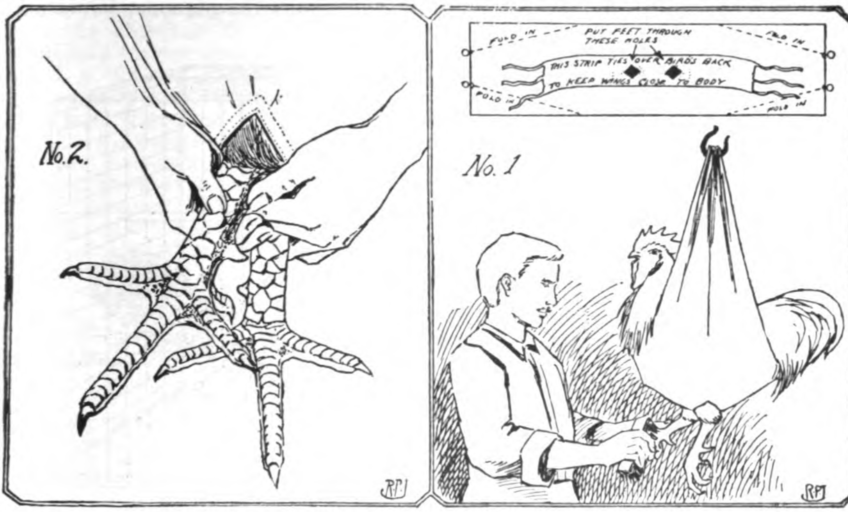


Fig. 130.

Fig. 131. You should build some exhibition coops in which to train your birds for the show.

Figure 131 represents exhibition coops being made by school children. Use white pine slats, 1x2 inches for the framework. Make the coop 2 feet square and 30 inches high. The sides and back can be made of white cloth and the front can be made of poultry wire netting, galvanized iron rods or heavy galvanized iron wire. The double coop can be made 4 feet square. The framework can be painted blue, which will add much to the attractiveness of the coops. Make a door in the front so it will be easy for the judge to remove the birds without breaking their feathers

Figure 132. One of the most reasonably priced, neatest and highest class exhibition coops is that made and sold by the Keipper Cooping Co.,

Milwaukee, Wisconsin. These coops are built singly, in pairs or in sections, several coops composing one section. They have a frame bottom, but an all-wire front, back, ends and top. This makes a coop that is very easy to construct for use in a poultry show room and when birds are placed in them they make a very neat and attractive appearance. The coops are so constructed as to eliminate any possibility of birds fighting. This company also makes the same style of coops for pigeons, bantams,

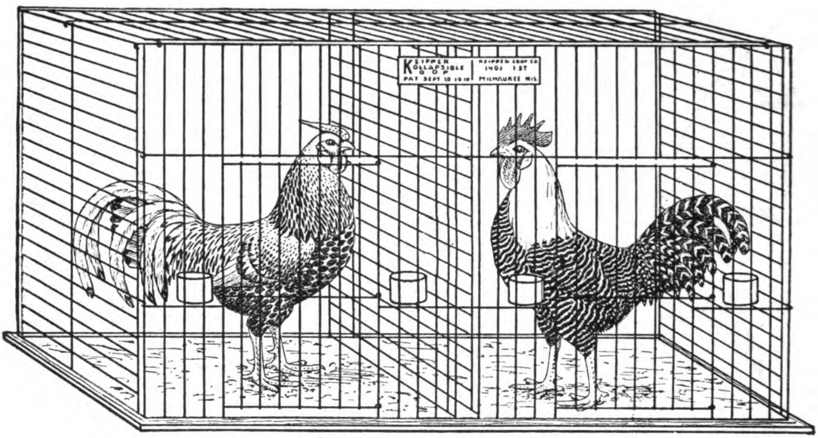


Fig. 132.

Fig. 133.

chickens, waterfowl and turkeys, as well as for pet stock. These coops are very popular with exhibitors and with poultry show managers. They also make splendid coops in which to train birds for exhibition. A few of them kept in a poultry house, on the wall, make a convenient place in which to keep and treat sick fowls.

Figure 133 shows crates for shipment of fowls and also baskets used in the shipping of eggs by parcel post or express. You will note the baskets in this case have a cover over them, but if you use an open basket, a cloth covering can be put on such as we have illustrated in our lesson on "Building Up a Trade in Pure Bred Poultry." The eggs should be packed as described in that lesson. There is no better or safer method of packing eggs than in ordinary split market baskets of this sort. In the lower left hand corner of the illustration you will see frames that are being made from shipping coops for exhibition poultry or birds intended for breeders. After this frame is built, then the entire coop is covered with muslin as is being done by the two men shown in the picture. To the right of the illustration and on the far side of the workshop, you can see the shipping coops after they are completed. After the cloth is tacked on the frame, then three rows or strips of light weight lumber are nailed about the coop. The cloth helps to protect the birds from the dust and helps prevent freezing to some extent, and also makes the bird more quiet than it would otherwise be if shipped in an open coop.

If you ship a bird in a coop that is made chiefly of cloth, the cloth might become torn in shipping, which would permit the bird to escape, but by nailing three extra strips of material entirely around the coop this loss is prevented. These coops should be made just as light as it is possible to make them, yet they should be substantial so that they will carry well. Coops of this sort should be built in three sizes, some for single birds, others for trios, and still larger coops for pens.

The Standard size for shipping coops for single birds intended for exhibition or breeding is 12 inches wide, 22 inches long and 24 inches high. For a trio, the size is 20 inches wide, 22 inches long and 24 inches high. Coops for pens should be made still larger.

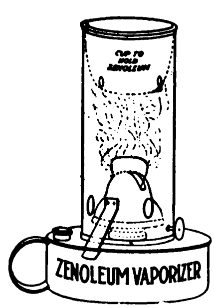


Fig. 134.

Figure 134 is a Vaporizer, sold by the Zenner Disinfectant Company of Detroit, Mich.

The Zenoleum, which is one of the best disinfectants, is placed in the cup shown at the top of the vaporizer. The flame below heats the solution of Zenoleum and the vapor arises and is inhaled by the birds on the roost or in the house. This is recommended by this company as a very good remedy for preventing or treating cases of colds and roup. It is at least worthy of trial and the Zenoleum and Vaporizer may be purchased from the above company. Other disinfectants might be used in a similar way with equally good results.

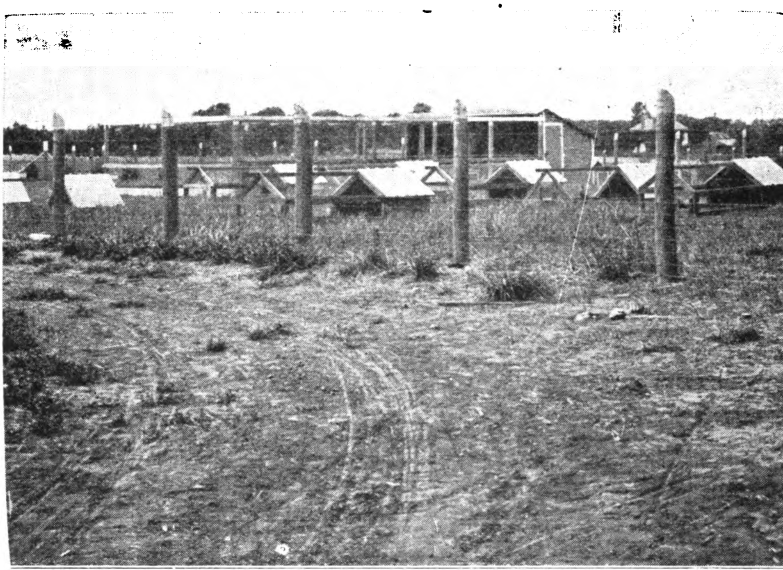


Fig. 135.

Figure 135 illustrates a neat fence for poultry, and also coops used in an intensive way in the suburbs of a large city. The coops are small and inexpensive, and are easily moved. Quite a large number of chickens can be raised on a small piece of ground, providing the soil is kept cultivated, some green food grown in same and the ground kept pure and sweet.

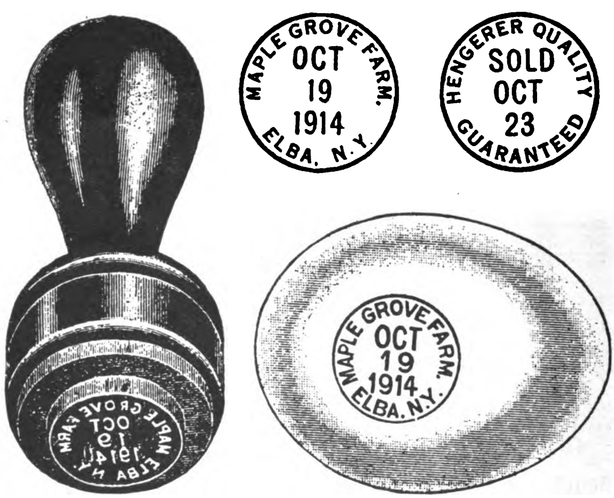


Fig. 136.

Figure 136 is a dating or marking stamp which is sold by Geo. B. Ferris of Grand Rapids, Mich. This should be so constructed that the stamping portion fits the egg. You can have the name of your farm and also the date stamped at the same time if you wish to do so. The stamp

can be inked on an ordinary inking pad and will give a clean, legible imprint on the egg. It is furnished with or without dates.

The name of a poultry club or such wording as is desired can be made for these stamps. In most cases we recommend marking the eggs with a lead pencil as the hen is released from the trap-nest or as the eggs are gathered. Then market the eggs at least twice a week. When the eggs are being marked or stamped, the same should be placed on the egg so that it will not show in the egg case when the eggs are put in place with the small end down. For that reason we recommend marking the small end of the egg only.

TECTOR

Tector is an article made by the Patton Paint Company of Milwaukee, Wisconsin. It is an oil or paint suitable for painting canvas or cloth of any sort which you wish to use as partitions in poultry houses or cloth used in connection with poultry appliances of any sort. The only difference between Tector and the ordinary paint or linseed oil is the fact that when painted with Tector, the cloth does not become stiff or easily torn like it does when painted with oils and ordinary paint. It should not be used on cloth that is used for ventilators. Tector practically makes the cloth water and air tight, but still leaves it perfectly appliable and easy to roll without cracking. This article is also sold by the Pittsburgh Plate Glass Company at practically all their warehouses.

Figure 139. This is a set of capon tools such as is used in caponizing cockerels. Full directions go with each set. This is quite a common practice and found quite profitable by some poultrymen. If you cannot secure these from your own dealer, we are in a position to furnish them at the lowest retail price, which is usually $4.50 to $5.00 per set.

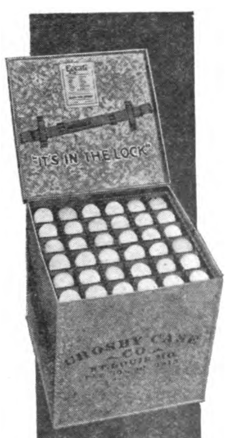


Fig. 138.

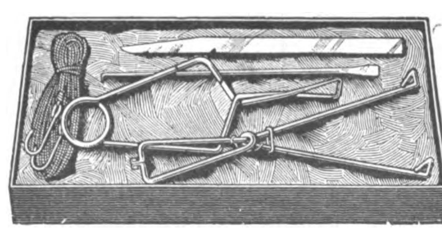


Fig. 139.

Figure 138 is a galvanized iron parcel post egg case. The size shown in this illustration holds 15 dozen eggs. It is made of galvanized iron and filled with the ordinary egg fillers. It has a patent lock on top and a handle for carrying same. The case is built durable and is the most satisfactory case we have ever used for shipping eggs by parcel post.

It is sold by the Crosby Case Company, St. Louis, Missouri.

These cases are built in various sizes and are very convenient for use in marketing eggs to special trade where the cases can be returned. If you only have a few eggs to market, this is a convenient and safe container for same. We recommend this case in preference to anything of the kind that we have ever used. This is a case that can be used over and over again. It is intended only for retail trade, and not for shipments where the cases are not returnable.

Fig. 140.

Figure 140 is a light weight egg case built the same size as an ordinary 30 dozen case. However, on one side of the partition, instead of filling it with eggs, it is filled with a galvanized box . This is made practically water tight, and when shipping to special customers, they somtimes want both eggs and dressed poultry. This case takes care of a

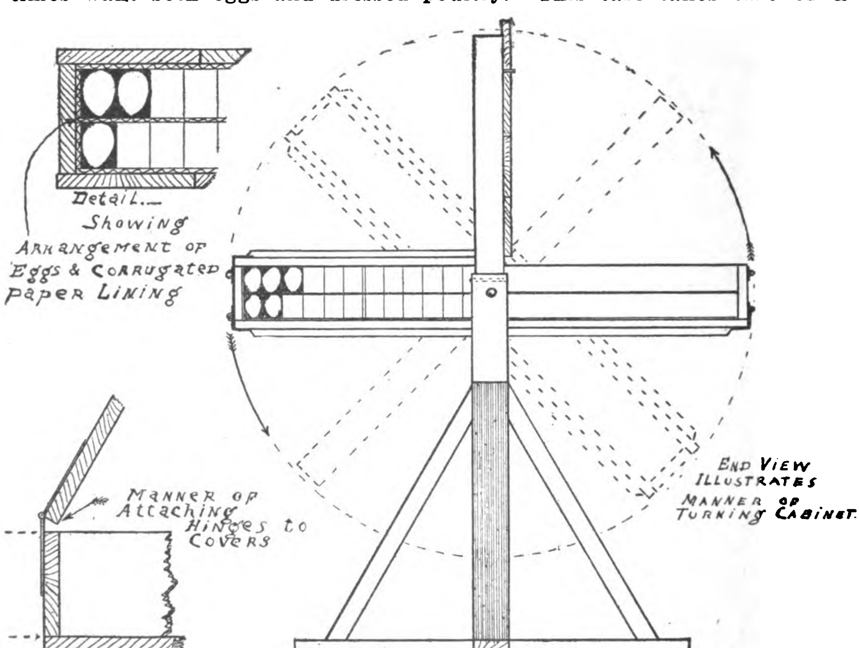


Fig. 141.

proposition of that nature. The birds may be dressed and placed in ice and placed on one side of the case and 15 dozen fresh eggs placed in the opposite end. The case for the poultry should be made rust proof and durable.

Figure 141 illustrates the end view of an egg cabinet. It shows the manner of turning the cabinet, the manner of attaching hinges to the cover and the arrangement of eggs and corrugated paper lining. This cabinet is designed to hold 860 eggs, which is about the proper size for the average poultry farm. However, it can be easily made larger. It is a labor-saving device when eggs are being held for hatching as it is necessary to turn the eggs twice if they are to be kept more than two or three days. When a great many eggs are set each season and they are all turned by hand, considerable labor is required each day to turn them while they are being saved for incubation. With the device illustrated, 860 eggs can be turned at the same time by simply revolving the table on its axle.

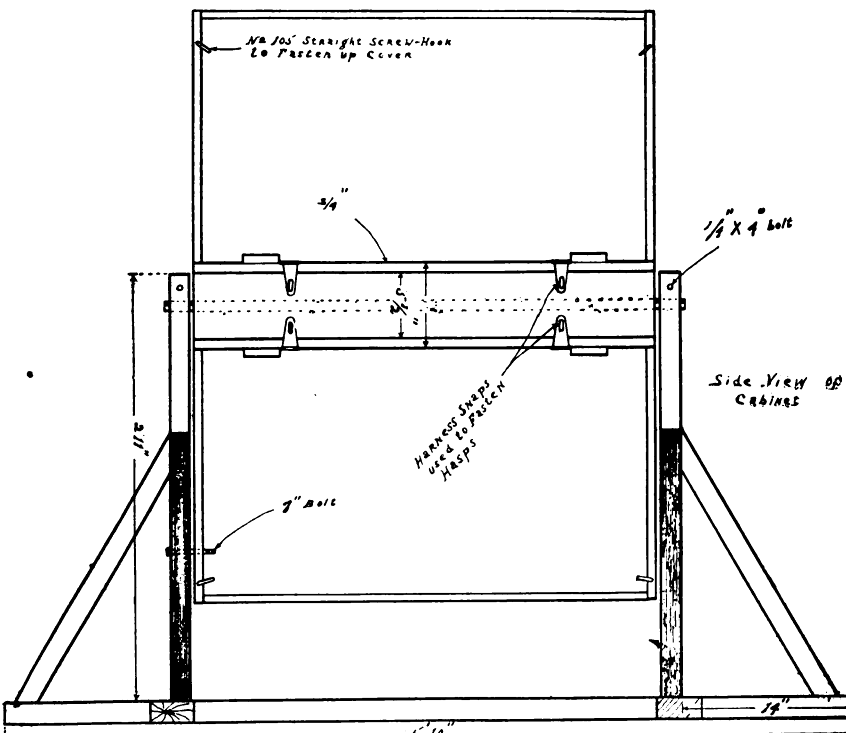


Fig. 142.

Figure 142. This shows the size of the frame material that is used and shows a side view of the cabinet frame with an end view of the cabinet in the center. You will note screw hooks at the top of the upright frame which fasten the covers and hold them in position while the eggs in the cabinet are being removed or the cabinet refilled. In the lower left hand corner, you will note a seven-inch bolt which has been run through the frame and through the board which holds the cabinet in position. When you wish to turn the eggs, this bolt is simply removed and the opposite end of the board is turned downward and the bolt again put in position, which holds the eggs on exactly the opposite side from which they were kept the day previous.

Figure 143. This shows one side of the egg cabinet proper. The lid has been lifted from one of the compartments which shows six ordinary egg case fillers in position, each holding three dozen eggs. Each compartment is again divided into six smaller ones, they being ¼x2¼-inch strips, notched to fit together where the egg fillers touch each other. By having the table divided this way into unit sections of three dozen eggs each, it is very easy to keep the eggs from special matings or special pens of breeders by themselves while being saved.

Double face corrugated cardboard is used to line the inside of the table and partition walls between the upper and lower compartments. Ordinary harness snaps are used to fasten the cover when shut. Before turning the cabinet, the operator ought to be certain that every door is fastened. Four common hinge hasps are used to lock covers by snapping an ordinary harness snap into each hasp after the cover is closed and securely fasten it.

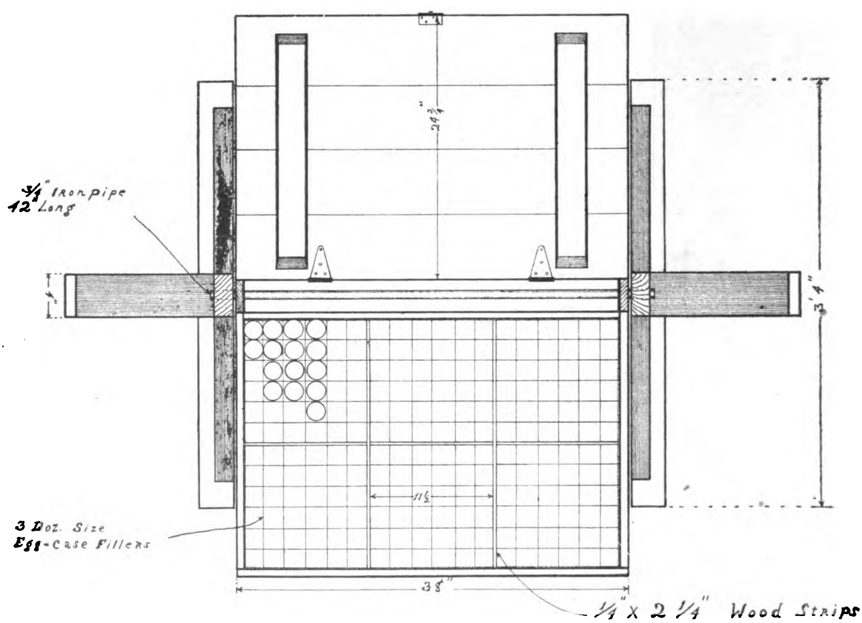


Fig. 143.

The inside measurement of each of the large egg compartments is about 23x34 inches. The inside measurement of the small egg chamber is about 11½x11½ inches square. These measurements were taken from wood to wood, previous to placing corrugated paper box in each lining. There are four of the large egg compartments and twenty-four of the smaller ones, as each of the small compartments hold 36 eggs. This makes a total of 860 eggs.

We especially call your attention to the manner in which the hinges are attached to the cover with reference to the egg case. You will note this in detail in one of the drawings.

Figure 144 represents a nesting device that is sometimes used for the purpose of preventing hens from eating their eggs after the eggs have been laid.

The bottom portion of the nest is about 6 or 8 inches in depth and just enough straw is used in same to prevent the egg from breaking as it drops through the hole from the nest above. The top of the nest is about 4 inches in depth and the top and bottom sections are divided with a piece of burlap or canvas tacked so that it fits loosely, and so that the burlap or canvas acts as a sort of hammock and forms the nest proper, on which the hen sits while on the nest.

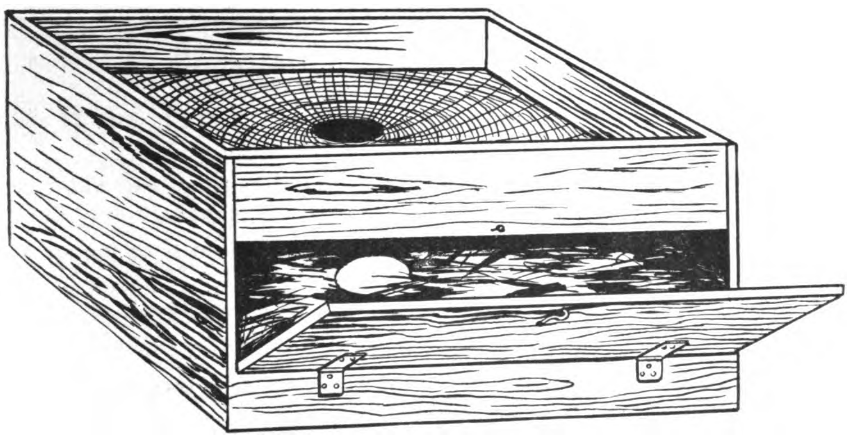


Fig. 144.

In the center of this cloth should be cut a hole just large enough so that the egg can pass through and drop to the straw below. This protects the eggs from the egg-eating hens. The front door is hinged and fastened with a button so that this can be opened and the eggs removed.

While only one nest is shown in this illustration, yet several nests can be joined together in one section.

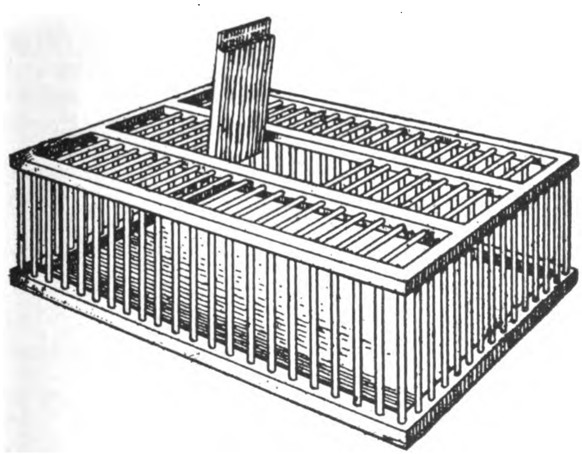


Fig. 145.

Figure 145 represents a shipping coop sold by The Ronda Coop Company of Ronda, North Carolina. The coop is very light, yet substantial and sanitary.

The door in the top is easily opened and closed, and we like this style coop better than most any shipping coop we have ever been able to find on the market. We believe you will find it entirely satisfactory.

QUESTIONS FOR LESSON NO. 5

1. What are the essential points of a dry mash hopper?
2. What are the best points about the hoppers shown in Fig. 24 and Fig. 25?
3. Describe a home-made drinking fountain, and how can water be provided in a convenient way for flocks on range?
4. What is the purpose of a dust wallow? Should it be indoor or out?
5. Describe the outdoor broody coop and its advantages.
6. How would you build a hatching box?
7. Describe the main features of a revolving door trap-nest.
8. Describe the advantages of the corn popper pedigree system.
9. How should an oat sprouter be made?
10. Describe a good temporary fencing or warding arrangement for baby chicks.

INDEX

Breeds and Varieties of Poultry

By T. E. QUISENBERRY AND V. O. HOBBS

Origin and History of Domestic Fowls

Much of the early history of some of the breeds and varieties is rather obscure, but some facts regarding the origin of the different varieties have been discovered by taking the original wild birds and by restriction, selection and breeding have produced in some cases the same type of fowl that was in question.

The domestic fowls of today have been developed from wild ancestors, the wild fowls which are native of Southern Asia. The two principal ones are the Red Jungle and Aseel fowls. The red jungle fowl is small, active and of a nervous temperament. From this fowl was developed the Mediterranean class in the countries around the Mediterranean sea.

The Aseel fowl is large and angular in form and of a slow, sluggish nature. From this bird was developed the large heavy meat breeds.

The all-purpose breeds were developed by crossing and recrossing the two breeds.

The domestic geese and ducks are decendants from the wild migratory geese and ducks found in the northern hemisphere, going to the northern part of the temperate zone for the summer where the young are raised, then migrating south to spend the winter.

The domestic turkeys are the descendants of the wild turkeys, natives of North America.

It is not the purpose of this lesson to go into all the details of the subject, but to give a general idea of the different leading varieties, and if any students wish minute details of all the Standard breeds, we then refer them to the American Standard of Perfection. We do not mean to say anything derogatory to any variety of poultry. There are good and bad strains in all varieties. We give you an idea of the good and bad points as we have found them in experimenting with them, and as their records were made in our egg laying contests. There is no one best variety. Much depends upon the use to which you expect to put them. We would not want a white variety for a congested district in a city. We would not expect to succeed on a commercial egg farm with an ornamental variety. We would not select the small Mediterranean breeds if we expected to do much caponizing. Select the variety you like best for color, shape, size, color of eggs, etc., and then stay with your chosen variety until you perfect it to meet your own ideas and Standard requirements as far as possible.

THE TEST OF VARIETIES IN EGG LAYING CONTESTS

One of the best tests for any variety of poultry is to see how they measure up in Egg Laying Contests when compared with other varieties where all are housed, fed and treated alike. The Missouri Poultry Experiment Station has just completed their annual National Contest. Some idea of the ability of the different varieties to produce eggs, consume food, etc., can be obtained from a report which that institution issued just following the close of their contest. The report contains the following facts:

"During the five years 401 pens have been entered, composed of 2,600 hens, from 37 states and 8 foreign countries, and representing 47 varieties of poultry. Some special contests have been held and a few pens dropped out during the progress of the contests. The ones here reported were in the regular contests and completed the year.

"The 2,600 hens consumed 195,351 pounds of feed, of which about one-third was mash and two-thirds grain, and laid 391,326 eggs(which is about two eggs for each pound of feed consumed. Each hen averaged eating 75 pounds of feed and laid 150 eggs. It is worthy of note that the average price of one egg and one pound of feed were about the same; i. e., when eggs are 1½c each, feed is 1½c per pound, and when eggs are 2c each, feed is 2c per pound, etc. Therefore, costs, profits, etc., can be estimated better in eggs than in dollars. It will be seen that 75 eggs pay the average hen's feed for one year; and fifteen eggs are estimated to pay other costs except labor. Then 90 eggs pay for feed and maintenance, and the hen which lays 100 eggs is 10 eggs profit, the hen which lays 150 eggs is 60 eggs profit, and worth six times as much as the hen which lays 100 eggs.

"There were 214 hens which laid less than 75 eggs per year, which is one out of every 12 hens which didn't pay for her feed. There were 305 hens which laid over 200 eggs per year, which is one out of every 8.5 hens which laid 200 eggs or over.

"In order to determine the influence of certain characteristics on egg production, the following observations were made:

All white varieties	averaged 156 eggs per year
All black varieties	averaged 148 eggs per year
All buff varieties	averaged 141 eggs per year
All parti-colored varieties	averaged 133 eggs per year
All Rose Comb varieties..................	averaged 147 eggs per year
All Single Comb varieties................	averaged 141 eggs per year
All varieties laying white shelled eggs...	averaged 141 eggs per year
All varieties laying brown shelled eggs...	averaged 137 eggs per year
All varieties with smooth shanks........	averaged 142 eggs per year
All varieties with feathered shanks......	averaged 114 eggs per year

"The 2,600 hens weighed 12,958 pounds, or an average of 5 pounds each, but the average of the 47 varieties, one hen of each, was 4½ pounds each. From the first to the last of the contests, all hens gained 1,422 pounds, or a gain of approximately ½ pound per hen. It was noted how ever, that the hens were as heavy about the middle as at the end of the contest, which is accounted for by the moulting condition of the hens on November first.

"During the five years, 265 hens died, which is a little over 10 per cent. The hens which died weighed 1,392 pounds and as 1,422 pounds were gained, the gain and loss almost balance, or in other words, if hens are kept and sold on November first, the gain in weight is balanced by loss in birds. If hens are sold in June or July the loss is half and gain in weight just as much as in November.

Plymouth Rock Comb—a type of single comb of male.

Laced Feather.

Single Comb Minorca—another type of single comb of male.

Wyandotte Comb—a type of rose comb of male.

Rose Comb Leghorn—another type of rose comb of male.

Plymouth Rock Comb—a type of single comb of female.

Leghorn Comb—another type of single comb of female.

"There were 5,301 hens that went broody, or an average of two times for each hen in the contests. All varieties where hens averaged going broody four or more times averaged 132 eggs per hen, while the varieties having no broodings averaged 125 eggs. The varieties going broody from one to four times laid the highest average of eggs.

"The eggs of all different varieties averaged 24.8 ounces per dozen. It is interesting to note that the eggs of all varieties are nearer the same size than the hens which lay them. The White Plymouth Rocks are twice as large as the White Leghorns, yet they lay eggs about the same size.

"The yearly prizes for pens and individuals were as follows:

			Variety	Eggs Laid	Average
First	)	Pen	R. C. Reds................	1,043	208
Contest	)	Individual	White Rock	281	
Second	)	Pen	S. C. W. Leghorns.........	2,073	207.3
Contest	)	Individual	R. C. Leghorn..............	261	
Third	)	Pen	S. C. W. Leghorns.........	2,304	230.4
Contest	)	Individual	S. C. W. Leghorns.........	286	
Fourth	)	Pen	Barred Rocks	1,050	210
Contest	)	Individual	Buff Wyandottes	247	
Fifth	)	Pen	Barred Rocks	1,185	237
Contest	)	Individual	S. C. W. Leghorn.........	275	

AN IDEAL

An ideal Leghorn comb showing the desired five points with properly shaped blade and rear point. For description see text of article.—F. L. Sewell.

DEFECTIVE

A Leghorn head showing a number of defects in shape, plumage, comb, wattles and ear-lobes that are often found and that make a bird a cull no matter how well bred. —F. L. Sewell.

Courtesy of the Reliable Poultry Journal.

REPORT OF THE THIRD (PULLET) YEAR

OF THE

VINELAND N. J. INTERNATIONAL EGG LAYING AND BREEDING CONTEST

The production and report for the three years of the New Jersey Egg Laying Contest gives additional information as to the possible record of the different varieties of chickens.

It is interesting to note that out of the 1,000 birds at the contest, 324 birds, or 32.4 per cent of all birds, laid 200 eggs or more. Of these 324 birds, 25 laid 250 eggs or more apiece during the year, and of the entire 1,000 birds only 69, or 6.9 per cent, laid less than 100 eggs per bird for the year.

Mention should be made at this point of the highest 10 pens for the entire three years of the contest. These pens represent a consistent high production, and were, with very few exceptions, among the leading pens for the first two years. They are as follows:

Pen No.	Variety	Production Eggs
76	White Leghorn	6085
88	White Leghorn	6845
65	White Leghorn	5709
43	White Leghorn	5680
39	Rhode Island Red	5672
92	White Leghorn	5670
67	White Leghorn	5663
1	Barred Plymouth Rock	5544
41	White Leghorn	5517
70	White Leghorn	5493

The highest production per pen for the third year was that made by pen 39, Rhode Island Reds, which laid 2,431 eggs, an average of 243 eggs per bird for the year. This is an exceptional production and the pen deserves a great deal of credit. The average per cent production for the year, together with the highest pen and its production for each variety, is shown in the following table:

Variety	Production Per Cent	High Pen	Production Eggs
Barred Plymouth Rocks	50.8	1	2222
White Plymouth Rocks	41.7	10	1869
Columbian Plymouth Rocks	41.7	17	1704
White Wyandottes	45.4	22	2225
Columbian Wyandottes	41.3	29	1707
Buff Wyandottes	39.6	31	1739
Rhode Island Reds	45.1	39	2431
White Leghorns	52.6	67	2289
Buff Leghorns	43.5	96	1822
Black Leghorns	45.1	98	1936

During the third year, the birds consumed 83,040.3 pounds of feed, of which 49,259.4 pounds consisted of mash and 33,780.9 pounds of grain. The ratio of mash to grain the third year was 1.4:1, that is 1.4 times as much mash as grain was consumed by the 1,000 birds. During the first year of the contest, practically equal amounts of mash and grain were consumed and during the second year 1.9 times as much mash as grain, or practically

twice as much. It will be noticed that there is every little difference in the total amount of feed consumed, since the first year the average consumed per bird was 79.5 pounds, during the second 81.5 pounds and the third year 83 pounds. Although a slight increase in the amount of feed was consumed this third year, it was used more efficiently than during the preceding years, since 3.7 pounds of feed were consumed for each pound of eggs produced during this last year, while during the first pullet year, 3.9 pounds of feed were needed for each pound of eggs, and during the yearling year 4.9 pounds were used for each pound of eggs. Naturally, there would be an increase in the amount of feed consumed when birds lay so much more, as they did this year. However, the increased amount of feed was used more efficiently than in former years.

The total cost of feed was $3,239.42, the average price for mash being $3.84 per hundred pounds and for grain $3.99 per hundred pounds. The average price for white eggs for the year was 69.2 cents per dozen and for brown eggs 60.9 cents. However, this is not the actual price received during the year, since during the season in which they are produced in large numbers they sell for the lowest price. The actual average was somewhat less than that given above—64.7 cents per dozen for white eggs and 57.5 cents for brown eggs. Using these prices in figuring the total receipts, we find that the value of the eggs produced was $9,234.71. Deducting $3,239.42 for cost of feed, the profit above feed for the whole contest was $5,995.29, or an average profit per bird above feed cost of $6.00. This enormous profit is due, in large part, to the high selling price of eggs but more especially to the large number of eggs produced. Such a profit as this is out of the question on a poultry farm where the production on the average is only 120 eggs per bird during the year.

A comparison of the various breeds, regardless of variety, as to feed consumed, eggs produced, cost of feed, profit, and per cent production is shown in the following table:

	Average Per Cent Production			
	Plymouth Rocks	Wyandottes	Rhode Island Reds	Leghorns
Amount of mash per bird (lbs)...	55.7	48.2	57.5	46.6
Amount of grain per bird (lbs.)...	34.0	33.8	33.8	33.7
Cost of mash per bird............	$2.15	$1.89	$2.22	$1.81
Cost of grain per bird............	$1.22	$1.24	$1.25	$1.07
Total cost per bird...............	$3.37	$3.13	$3.47	$2.88
Number of eggs per bird..........	169.2	158.1	164.2	188.0
Average per cent production per bird	46.4	43.3	45.0	51.5
Average price per dozen..........	.575	.575	.575	.647
Value of eggs per bird............	$8.11	$7.59	$7.88	$10.14
Return over cost of feed..........	$4.74	$4.46	$4.41	$7.26

It will be noticed in the above table that the cost of feed varied from $2.88 per bird in the case of the Leghorns to $3.47 per bird in the case of the Rhode Island Reds, just as the average per cent production varied for the year in the case of the Leghorns from 51.5 to 43.3 per cent in case of the White Wyandottes. Most poultrymen feel that if they can maintain an average of 50 per cent as was done at the contest, they have done extremely well. This shows what proper breeding and proper feeding will do toward the establishment of a high-producing flock. The gross income varies from $7.59 for the White Wyandottes to $10.14 for Leghorns while the profit per bird was $4.74 for Plymouth Rocks, $4.46 for the Wyandottes, $4.41 for the Rhode Island Reds, and $7.26 for the Leghorns.

"The following table deals with many of the common questions pertaining to poultry, such as the number of varieties which have been entered in the contests and the number of years and hens represented by each variety, the per cent of hens laying less than 75 eggs per year, the per cent laying over 200 eggs, the per cent of hens going broody each year in each variety, and the per cent of hens dying from all causes. In giving the per cents, fractions are omitted:

	Varieties	Years Represented	No. Hens 5 Years	Per Cent 200-Egg Hens	Per Cent Hens Less Than 75 Eggs	Per Cent Broody Hens	Per Cent Mortality
1.	S. C. White Leghorns	5	460	20	6	30	9
2.	Barred Rocks	5	190	13	10	200	8
3.	S. C. Reds	5	180	17	5	300	8
4.	R. C. Reds	5	135	10	5	336	8
5.	White Wyandottes	5	130	20	8	245	18
6.	White Orpingtons	5	125	7	12	375	15
7.	Silver Wyandottes	5	115	20	5	321	9
8.	White Plymouth Rocks	5	115	10	3	151	7
9.	Buff Orpingtons	5	105	7	7	480	14
10.	Anconas	5	100	8	7	26	10
11.	Black Orpingtons	5	90	9	15	304	18
12.	Black Langshans	5	85	7	5	314	9
13.	S. C. Buff Leghorns	5	80	5	5	52	4
14.	Buff Rocks	4	90	5	9	433	3
15.	S. C. Black Minorcas	4	75	7	4	43	9
16.	S. C. Brown Leghorns	4	60	1	15	23	3
17.	R. C. White Leghorns	4	60	5	16	38	5
18.	Buff Wyandottes	3	70	17	3	317	4
19.	R. C. Black Minorcas	3	50	4	12	22	22
20.	Partridge Wyandottes	2	40	0	22	470	5
21.	Partridge Rocks	2	35	0	28	397	11
22.	Rhinelanders	2	25	12	0	0	28
23.	Missouri White Fluffs	2	15	7	7	146	20
24.	Silver Campines	2	15	0	20	0	13
25.	Columbian Wyandottes	2	10	0	0	450	0
26.	Hamburgs	1	15	0	20	20	7
27.	Cornish	1	10	0	20	450	0
28.	White Langshans	1	10	0	10	240	5
29.	Golden Campines	1	20	5	10	0	20
30.	D. Laced Leghorns	1	5	20	5	0	0
31.	R. C. Brown Leghorns	1	5	0	0	20	0
32.	Dominique Leghorns	1	5	0	0	260	0
33.	S. C. Black Leghorns	1	5	0	0	0	0
34.	Columbian Plymouth Rocks	1	5	0	20	240	20
35.	Golden Wyandottes	1	5	20	0	220	40
36.	Silver Penciled Wyandottes	1	5	0	0	220	20
37.	Light Brahmas	1	5	0	60	240	40
38.	Buff Brahmas	1	5	0	40	160	20
39.	S. C. R. I. White	1	5	0	0	220	20
40.	R. C. R. I. Whites	1	5	40	0	220	0
41.	Houdans	1	5	0	40	0	0
42.	Spanish	1	5	0	20	0	20
43.	Buttercups	1	5	0	0	0	20
44.	Oregons	1	5	100	0	160	0
45.	Buckeyes	1	5	0	0	420	0
46.	Cochins	1	5	0	20	440	0
47.	Cross Breds	1	5	0	0	360	0

"The following table gives the name of each variety of hens entered in the five contests, the average weight of the hens, the average number of pounds of feed consumed, the gain in weight from the first to the last of the contest, the average weight of one dozen eggs of each variety, and the profit from each hen in each variety.

"Each pound of feed and each egg were valued at 1½c each, which was about the average price for the five years at this place. Nothing is considered in arriving at the profit except feed and eggs:

	Varieties	Average Weight	Lbs. Feed 1 Year Per Hen	Gain in Weight	Weight One Dozen Eggs	Average Eggs Laid Per Year	Profit Above Feed
1.	S. C. W. Leghorns	3½ lb.	71 lb.	½ lb.	25.7 oz.	162	$1.365
2.	Barred Rock	6 lb.	88 lb.	½ lb.	25.4 oz.	146	.87
3.	S. C. Reds	5½ lb.	78 lb.	¼ lb.	26.4 oz.	157	1.185
4.	R. C. Reds	6 lb.	81 lb.	¼ lb.	27.4 oz.	153	1.08
5.	White Wyandottes	5½ lb.	75 lb.	¼ lb.	24.9 oz.	163	1.32
6.	White Orpingtons	6¾ lbs.	82 lb.	¾ lb.	26.6 oz.	135	.795
7.	Silver Wyandottes	4½ lb.	70 lb.	½ lb.	24.8 oz.	162	1.38
8.	White Rocks	7 lb.	87 lb.	¾ lb.	26.5 oz.	148	.915
9.	Buff Orpingtons	6¼ lb.	81 lb.	1 lb.	26.3 oz.	149	1.02
10.	Anconas	3¾ lb.	68 lb.	¾ lb.	27.5 oz.	151	1.245
11.	Black Orpingtons	6½ lb.	75 lb.	½ lb.	25.2 oz.	140	.975
12.	Black Langshans	6¾ lb.	90 lb.	1¼ lb.	27.2 oz.	158	1.02
13.	S. C. Buff Leghorns	3½ lb.	60 lb.	½ lb.	24.7 oz.	138	1.17
14.	Buff Rocks	6¾ lb.	86 lb.	½ lb.	25.8 oz.	136	.75
15.	S. C. Black Minorcas	5½ lb.	90 lb.	½ lb.	27.8 oz.	155	.975
16.	S. C. Brown Leghorns	3¼ lb.	60 lb.	½ lb.	23.4 oz.	140	1.20
17.	R. C. W. Leghorns	3 lb.	61 lb.	½ lb.	23.4 oz.	133	1.08
18.	Buff Wyandottes	5¾ lb.	72 lb.	¾ lb.	23.4 oz.	169	1.455
19.	R. C. Black Minorcas	4¾ lb.	64 lb.	¼ lb.	26.6 oz.	131	1.005
20.	Partridge Wyandottes	3½ lb.	71 lb.	¾ lb.	23 oz.	107	.54
21.	Partridge Rocks	4¾ lb.	71 lb.	¾ lb.	23.1 oz.	112	.615
22.	Rhinelanders	3¾ lb.	60 lb.	½ lb.	24.1 oz.	138	1.175
23.	Missouri White Fluffs	5 lb.	75 lb.	¾ lb.	24.3 oz.	139	.96
24.	Silver Campines	2¼ lb.	62 lb.	1 lb.	24.8 oz.	123	.915
25.	Columbian Wyandottes	4¾ lb.	71 lb.	½ lb.	24.8 oz.	149	1.17
26.	Hamburgs	2¾ lb.	64 lb.	½ lb.	21.6 oz.	116	.78
27.	Cornish	5 lb.	69 lb.	½ lb.	23.7 oz.	105	.54
28.	White Langshans	5½ lb.	71 lb.	1 lb.	26.7 oz.	103	.48
29.	Golden Campines	2¼ lb.	62 lb.	1 lb.	24.8 oz.	140	1.17
30.	D. Laced Leghorns	3¼ lb.	60 lb.	¼ lb.	21.3 oz.	123	.945
31.	R. C. Brown Leghorns	3 lb.	60 lb.	½ lb.	22.4 oz.	178	1.17
32.	Dominique Leghorns	3 lb.	61 lb.	½ lb.	23.4 oz.	153	1.38
33.	S. C. Black Leghorns	3¼ lb.	61 lb.	¼ lb.	23.7 oz.	169	1.62
34.	Columbian Rocks	5 lb.	63 lb.	½ lb.	25 oz.	87	.36
35.	Golden Wyandottes	4 lb.	63 lb.	¼ lb.	22 oz.	136	1.095
36.	Silver Pencil'd Wyandottes	3½ lb.	63 lb.	½ lb.	21.5 oz.	141	1.17
37.	Light Brahmas	6 lb.	80 lb.	¾ lb.	24 oz.	80	.00
38.	Buff Brahmas	5¼ lb.	81 lb.	½ lb.	26 oz.	110	.435
39.	S. C. R. I. Whites	5¾ lb.	78 lb.	½ lb.	26.2 oz.	164	1.29
40.	R. C. R. I. Whites	5¼ lb.	78 lb.	¼ lb.	26.4 oz.	187	1.635
41.	Houdans	4 lb.	73 lb.	¼ lb.	26.7 oz.	86	.195
42.	Spanish	3¼ lb.	73 lb.	¼ lb.	26.2 oz.	97	.36
43.	Buttercups	2¾ lb.	67 lb.	½ lb.	25.4 oz.	123	.84
44.	Oregons	3½ lb.	71 lb.	½ lb.	26.1 oz.	232	2.415
45.	Buckeyes	4½ lb.	66 lb.	½ lb.	24 oz.	130	.96
46.	Cochins	4¾ lb.	79 lb.	¾ lb.	25 oz.	121	.63
47.	Cross Breds	4 lb.	79 lb.	¼ lb.	24 oz.	148	1.035

"As no test should be considered seriously, till it has been tried a number of times, the records of the last eighteen varieties in the table should not be considered definite, for there was only one pen of each, and for only one year. They are given here simply to give a complete record of the five years' contest work."

OWN A STANDARD OF PERFECTION

We can give you but a smattering of the facts relative to the various breeds and varieties. But you can get a general idea of some of the important things to be desired, and you can see how important a knowledge of the breeds and varieties is to anyone expecting to engage in the poultry business. You should by all means obtain a copy of the Standard of Perfection and learn what the requirements really are for the various varieties of fowls.

CLASS, BREED, VARIETY AND STRAIN

It is necessary to know the terms which are used in the classification of fowls.

All the fowls originating in any country are placed in one class and are named after the country where they originated. There may be a great difference in size and shape of the different fowls which originate in any one country. All the fowls which are the same size and shape are said to belong to the same breed.

A number of fowls may be the same size and shape, but many differ or vary in some respects, such as the color of the feathers or a difference in the shape of the comb, etc. These would be called varieties, such as Barred Plymouth Rocks, White Rocks, Buff Rocks, Partridge Rocks, etc. Each is of the same breed—Plymouth Rock—but the color designates the variety.

The last division is the family or strain. Some fowls may have originated in the same country, and they, therefore, belong to the same class; they may be the same size and shape and, therefore, would belong to the same breed; they may be the same color and the combs may be the same, so they would be of the same variety; but they may have been grown by different men till they have certain family characteristics. The name relating to the family is strain.

The following diagram will assist in learning the classification:

	BREED	VARIETY	STRAIN
AMERICAN CLASS	Plymouth Rocks	Barred White Buff Silver Penciled Partridge Columbian Blue	Thompson Latham Bradley Bros. Hawkins Henderson
	Wyandottes	Silver Golden White Buff Black Partridge Silver Penciled Columbian	Martin Keeler Duston Ruby Funk Yankee Sullivan
	Rhode Island Reds	Single Comb Rose Comb	Kemp Mahood Ricksecker Tompkins

Many of the varieties which we fail to describe are just as worthy as those which we have described. We describe some and pass others simply to give you some idea of the more prominent varieties in each class and not because the others are lacking in true worth.

GLOSSARY OF TERMS

Barring—Stripes running across the feathers at right angle to the shaft.

Blade—The rear part of a single comb, back of the last point.

Breed—A sub-division of class which applies to all fowls having the same shape.

Cock—A male bird over one year old.

Cockerel—A male bird less than a year old.

Creamy—The feathers in white varieties showing a yellowish or creamy appearance.

Capon—An unsexed male fowl.

Cushion—A mass of feathers at the base of the tail of female giving the effect of a cushion (see Cochin female).

Disqualification—A defect so serious as to throw the bird out of competition.

Ear-Lobes—The folds of bare skin just beneath the ears; very prominent in white ear-lobed varieties.

Face—The bare skin around and beneath the eyes.

Feathers—A web supported by a quill.

Flights—The primary feathers of the wing or those on the outer joint of the wing. They fold out of sight when the wing is folded.

Flight Coverts—The short feathers covering the quills of the flights.

Fluff—The soft downy portion of a feather. Also applied to the feathers around the body and vent.

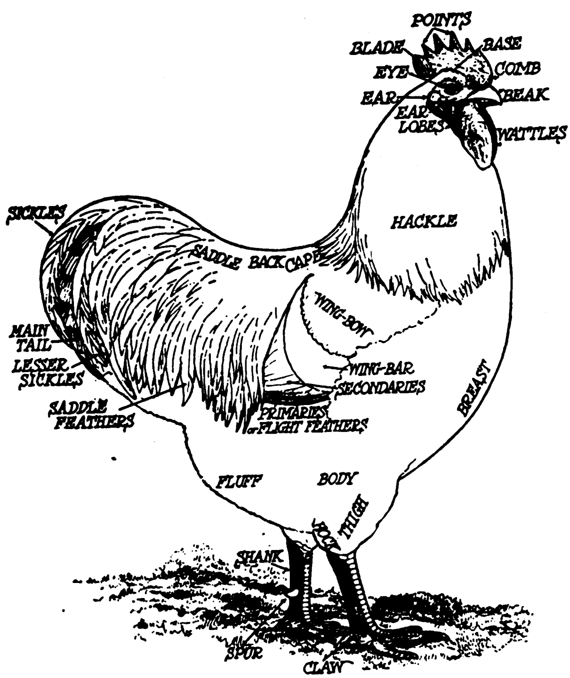


Diagram Showing the Locations and Names of the Various Parts of a Fowl.

Hackle — The neck feathers.

Leg — Includes the thigh and shank.

Lesser Sickles—Tail coverts, and also all sickle feathers except the two central large ones.

Mealy — Looks as though sprinkled with meal. An example is buff stippled with white. (A defect.)

Mottled Plumage — Plumage having spots of different shades and color.

Parti-colored — Fowls having two or more colors.

Pen—For show purposes a pen consists of a male and four females.

Display Pen—Generally used for show purposes, consists of one male and nine females.

Poultry — Domestic fowls reared for meat and eggs.

Primaries — See flights.

Pullet—Female fowl under a year old.

Saddle—The rear part of the back of a male bird just in front of the tail. Includes saddle feathers.

Saddle feathers—Feathers growing from the saddle.

Saddle Hackle—The long, narrow feathers growing from the saddle of male and extending down the side of the bird.

Secondaries—The large, long feathers growing on the second joint of the wing. They show when the wing is folded. The primaries and secondaries form the main wing feathers.

Shaft—The quill of a feather.

Shafting—When the quill of the feather is different in color than the web. (A defect).

Sickles—The long curved feathers of the tail of a male bird. This applies to the upper pair, the remainder being called the lesser sickles,

Side Sprig—A point or growth on the side of a single comb (disqualification).

Spur—A horny mass growing from the inner side of the shank.

Squirrel-tail—When the tail is carried ahead of the base.

Surface Color—The visible color of a bird when quiet.

Tail Coverts—The curved feathers at side and in front of the tail.

Tail feathers—The straight stiff feathers of the tail inside the tail coverts.

Thumb Marks—Dents at the base and side of a single comb or on top of a rose comb, giving the appearance of having been made by forcing the end of the thumb into the comb (a defect).

Twisted Feathers—The quill of the feather being twisted (a defect).

Under-Color—The fluff part of a feather not visible when bird is quiet.

Variety—A sub-division of breed, usually determined by color and kind of comb. Single Comb Rhode Island Red, and White Plymouth Rock, etc.

Webb (of feathers)—The flat portion of a feather.

Wattles—The flat pendulous growth hanging from the base of the jaw.

Wing Bar—The midlle portion of the wing formed by the coverts of the primaries and secondaries.

Wing Bay—The triangular three-cornered portion of the wing below the wing bar.

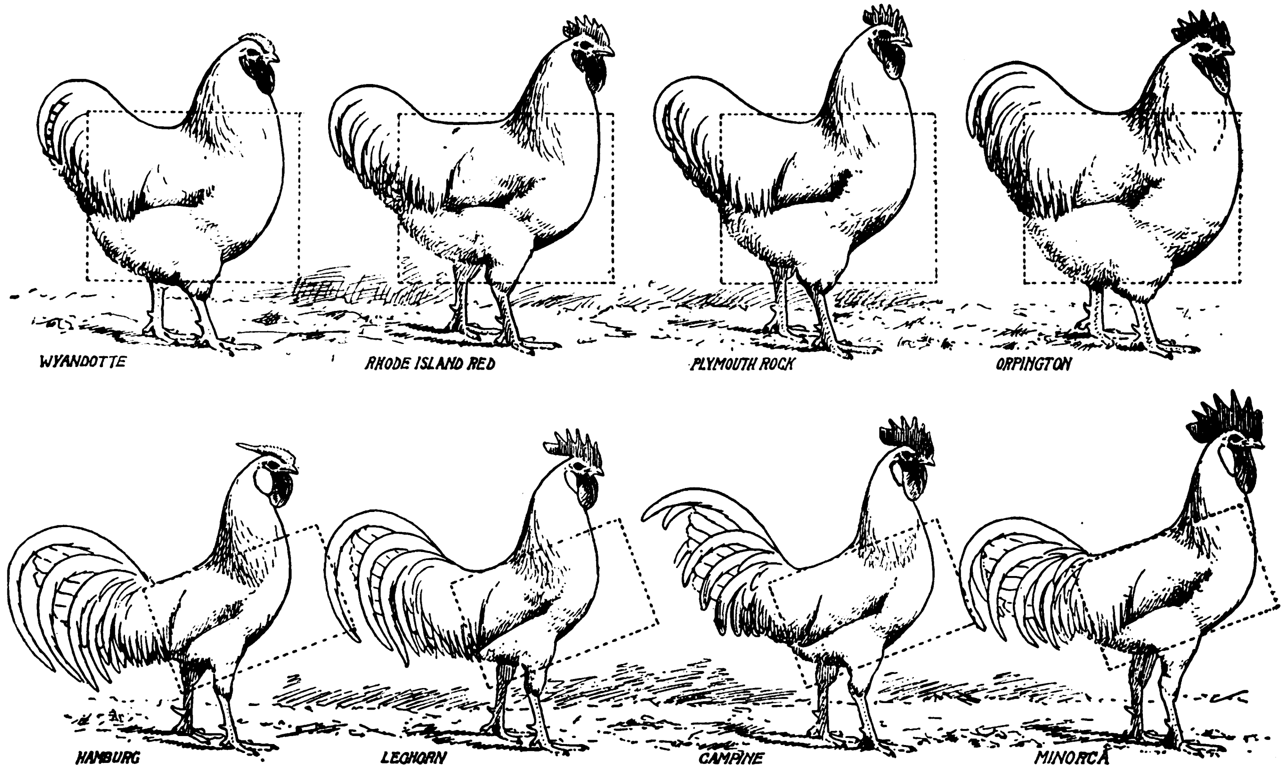
Wing Bow—The upper or shoulder part of the wing.

Wing Coverts—The small feathers covering the base of the primaries and secondaries.

Wry Tail—Tail carried to one side (a disqualification).

GENERAL DISQUALIFICATIONS

General disqualifications are those which apply to all varieties and debar the bird from competition. The following are the most common: Feathers on the legs or toes of clean-shanked varieties; side sprig—a point growing on the side of a single comb; squirrel tail—a tail carried in front of a perpendicular line at the base of the tail; clipped wings, except in wild geese or ducks; entire absence of main tail feathers; wry tail; absence of spike in rose comb; birds so small that the weight cut exceeds four points, except in Turkeys, Ducks and Geese. The right thing to do is to secure a copy of the American Standard of Perfection. This gives all the disqualifications, defects and requirements for the different varieties. Other common disqualifications are shanks which have been plucked, beaks that are deformed, backs that are crooked, combs different from that required for the variety, etc.



The above plates, showing a comparison of breed types, offers a splendid opportunity for study and should prove of educational value to judges, breeders and amateurs. It is seldom that the variations of breed types are so clearly set forth and a little time spent in the study of the above illusrations should firmly impress upon the mind of the average breeder or judge a picture of the general outlines of the various varieties here illustrated, and give them a firmer understanding of Standard requirements as applied to shape. The credit for the various types portrayed above belongs to Artist Schilling.

Class and Breed	Variety	Color of Skin	Weight				Kind of Comb
			Cock	Cock-erel	Hen	Pullet	
American Plymouth Rocks	Barred	Yellow	9½	8	7½	6	Single
	White	Yellow	9½	8	7½	6	Single
	Buff	Yellow	9½	8	7½	6	Single
	Silver Penciled	Yellow	9½	8	7½	6	Single
	Partridge	Yellow	9½	8	7½	6	Single
	Columbian	Yellow	9½	8	7½	6	Single
	Blue	Yellow	9½	8	7½	6	Single
Wyandottes	Silver	Yellow	8½	7½	6½	5½	Rose
	Golden	Yellow	8½	7½	6½	5½	Rose
	White	Yellow	8½	7½	6½	5½	Rose
	Buff	Yellow	8½	7½	6½	5½	Rose
	Black	Yellow	8½	7½	6½	5½	Rose
	Partridge	Yellow	8½	7½	6½	5½	Rose
	Silver Penciled	Yellow	8½	7½	6½	5½	Rose
	Columbian	Yellow	8½	7½	6½	5½	Rose
Javas	Black	Yellow	9½	8	7½	6½	Single
	Mottled	Yellow	9½	8	7½	6½	Single
Dominiques	Barred	Yellow	7	6	5	4	Rose
R. I. Reds	Red	Yellow	8½	7½	6½	5	Single and Rose
Buckeyes	Red	Yellow	9	8	6½	5½	Pea
Chantecler	White	Yellow	9	8	7	6½	Smooth
Asiatic Brahmas	Light	Yellow	12	10	9½	8	Pea
	Dark	Yellow	11	9	8½	7	Pea
Cochins	Buff	Yellow	11	9	8½	7	Single
	Partridge	Yellow	11	9	8½	7	Single
	White	Yellow	11	9	8½	7	Single
	Black	Yellow	11	9	8½	7	Single
Langshans	Black	White	9½	8	7½	6½	Single
	White	White	9½	8	7½	6½	Single
Mediterranean Leghorns	Brown Dark and Light	Yellow	5½	4½	4	3½	Single and Rose
	White	Yellow	5½	4½	4	3½	Single and Rose
	Buff	Yellow	5½	4½	4	3½	Single and Rose
	Black	Yellow	5½	4½	4	3½	Single
	Silver	Yellow	5½	4½	4	3½	Single
	Red Pyle	Yellow	5½	4½	4	3½	Single
Minorcas	Black	White	9	7½	7½	6½	Single
	Black	White	8	6½	6½	5½	Rose
	White	White	8	6½	6½	5½	Single and Rose
	Buff	White	8	6½	6½	5½	Single
Spanish	Black	White	8	6½	6½	5½	Single
Blue Andalusians	Blue	Gray	6	5	5	4	Single
Anconas	Mottled	Yellow	5½	4½	4½	3½	Single and Rose
English Dorkings	White	White	7½	6½	6	5	Rose
	Silver Gray	White	8	7	6½	5½	Single
	Colored	White	9	8	7	6	Single
Redcaps		White	7½	6	6	5	Rose
Orpingtons	Buff	White	10	8½	8	7	Single
	Black	White	10	8½	8	7	Single
	White	White	10	8½	8	7	Single
	Blue	White	10	8½	8	7	Single
Cornish	Dark	Yellow	10	8	7½	6	Pea
	White	Yellow	10	8	7½	6	Pea
	White-laced	Yellow	8	7	8	5	Pea
Sussex	Speckled	White	9	7½	7	6	Single
	Red	White	9	7½	7	6	Single
Polish Polish	White Crested Black	White	*	*	*	*	V-Shaped
	Bearded Golden	White	*	*	*	*	V-Shaped
	Bearded Silver	White	*	*	*	*	V-Shaped
	Bearded White	White	*	*	*	*	V-Shaped
	Buff Laced Non-Bearded	White	*	*	*	*	V-Shaped

* No Standard weight.

CLASSIFICATION OF BREEDS

Class and Breed	Variety	Color of Skin	Weight				Kind of Comb
			Cock	Cock-erel	Hen	Pullet	
	Golden	White	*	*	*	*	V-Shaped
	Non-Bearded Silver	White	*	*	*	*	V-Shaped
	Non-Bearded White	White	*	*	*	*	V-Shaped
Hamburgs							
Hamburgs	Golden Spangled	Gray	*	*	*	*	Rose
	Silver Spangled	Gray	*	*	*	*	Rose
	Golden Penciled	Gray	*	*	*	*	Rose
	Silver Penciled	Gray	*	*	*	*	Rose
	White	Gray	*	*	*	*	Rose
	Black	Gray	*	*	*	*	Rose
French							
Houdans	Mottled	White	7½	6½	6½	5½	V-Shaped
	White	White	7½	6½	6½	5½	V-Shaped
Crevecoeurs	Black	White	8	7	7	6	V-Shaped
La Fleche	Black	White	8½	7½	7½	6½	V-Shaped
Faverolles	Salmon	White	8	7	6½	5½	Single
Continental							
Campines	Silver	White	6	5	4	3½	Single
	Golden	White	6	5	4	3½	Single
Games and Game Bantams							
Games	Black-breasted Red		*	*	*	*	Single
	Brown-red	White	*	*	*	*	Single
	Golden Duckwing		*	*	*	*	Single
	Silver Duckwing		*	*	*	*	Single
	Birchen	White	*	*	*	*	Single
	Red Pyle	Yellow	*	*	*	*	Single
	White	Yellow	*	*	*	*	Single
	Black	White	*	*	*	*	Single
Game Bantams	Black-breasted Red		22oz.	20oz.	20oz.	18oz.	Single
	Brown-Red	White	22	20	20	18	Single
	Golden Duckwing		22	20	20	18	Single
	Silver Duckwing		22	20	20	18	Single
	Birchen	White	22	20	20	18	Single
	Red Pyle	Yellow	22	20	20	18	Single
	White	Yellow	22	20	20	18	Single
	Black	White	22	20	20	18	Single
Orientals							
Sumatras	Black	White	*	*	*	*	Pea
Malays	Black-breasted Red	Yellow	9	7	7	5	Strawberry
Malay Bantams	Black-breasted Red	Yellow	26oz.	24oz.	24oz.	22oz.	Strawberry
Ornamental Bantams							
Sebright	Golden	White	26oz.	22oz.	22oz.	20oz.	Rose
	Silver	White	26	22	22	20	Rose
Rose-Comb	White	White	26	22	22	20	Rose
	Black	White	26	22	22	20	Rose
Booted	White	White	26	22	22	20	Single
Brahmas	Light	Yellow	30	26	26	24	Pea
	Dark	Yellow	30	26	26	24	Pea
Cochins	Buff	Yellow	30	26	26	24	Single
	Partridge	Yellow	30	26	26	24	Single
	White	Yellow	30	26	26	24	Single
	Black	Yellow	30	26	26	24	Single
Japanese	Black-tailed	Yellow	26	22	22	20	Single
	White	Yellow	26	22	22	20	Single
	Black	Yellow	26	22	22	20	Single
	Gray	Yellow	26	22	22	20	Single
Polish	Bearded White	White	26	22	22	20	V-Shaped
	Buff-Laced	White	26	22	22	20	V-Shaped
	Non-Bearded	White	26	22	22	20	V-Shaped
Mille Fleur	Booted		26	22	22	20	Single
Miscellaneous							
Silkies	White	Blue	*	*	*	*	Nearly Round
Sultans	White	White	*	*	*	*	V-Shaped
Frizzles	Any Color		*	*	*	*	Single

* No Standard weight.

CLASSIFICATION OF BREEDS

Class and Breed	Variety	Color of Skin	Weight				Kind of Comb
			Adult Drake	Young Drake	Adult Duck	Young Duck	
Ducks							
Pekin	White		9	8	8	7	
Aylesbury	White		9	8	8	7	
Rouen	Colored		9	8	8	7	
Cayuga	Black		8	7	7	6	
Call	Gray		*	*	*	*	
	White		*	*	*	*	
East India	Black		*	*	*	*	
Muscovy	Colored		10	8	7	6	
	White		10	8	7	6	
Swedish	Blue		8	6½	7	5½	
Buff	Buff		8	7	7	6	
Crested	White		7	6	6	5	
Runner	Fawn and White		4½	4	4	3½	
	White		4½	4	4	3½	
	Penciled		4½	4	4	3½	
Geese			Adult Gander	Young Gander	Adult Goose	Young Goose	
Toulouse	Gray		26	20	20	16	
Embden	White		20	18	18	16	
African	Gray		20	16	18	14	
Chinese	Brown		12	10	10	8	
	White		12	10	10	8	
Wild or Canadian	Gray		12	10	10	8	
Egyptian	Colored		10	8	8	6	
Turkeys			Adult cock	Y'rling cock	Cock'rel	Hen	Pullet
	Bronze		36	33	25	20	16
	Narragansett		30	25	20	18	12
	White Holland		28	24	20	18	14
	Black		27	22	18	18	12
	Slate		27	22	18	18	12
	Bourbon Red		30	25	20	18	12

* No Standard weight.

AMERICAN CLASS NO. 1

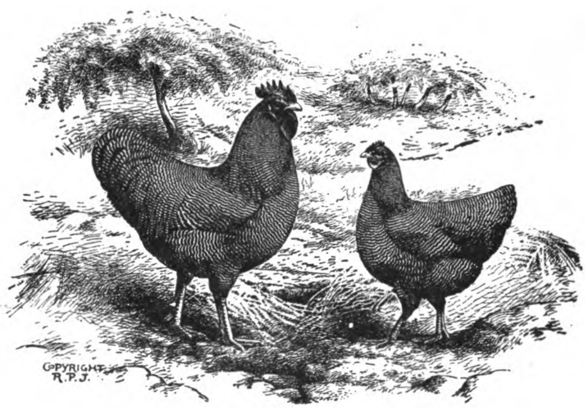
BREEDS	VARIETIES
Plymouth Rocks	Barred White Buff Silver Penciled Partridge Columbian Blue
Wyandottes	Silver Golden White Buff Black Partridge Silver Penciled Columbian
Javas	Black Mottled

BREEDS	VARIETIES
Dominiques	Rose Comb
Rhode Island Reds	Single Comb Rose Comb
Buckeye	Pea Comb
Chanticler	Smooth Comb

There are seven breeds and twenty-two varieties in the American class.

BARRED PLYMOUTH ROCKS

The Plymouth Rocks belong to the American class because they were developed in America. There are seven varieties, the variations being



on color, as all varieties have single combs and smooth, yellow shanks, and are the same shape and weight.

The varieties are the Barred, White, Buff, Silver Penciled, Partridge, Columbian, and Blue.

The Barred is the oldest and best known variety. It is so named because of Black and White bars running across the feather. The Silver Penciled is very much like the Dark Brahma in color and the Columbian variety is colored like the Light Brahma. The color of the Partridge variety should be like the Partridge Cochin.

The Plymouth Rocks produce large numbers of brown shelled eggs, and also produce flesh rapidly, so they belong to the dual or all-purpose breeds.

The American Standard of Perfection weights for the cock and hen are 9½ pounds and 7½ pounds, respectively, the cockerel weighs eight pounds and the pullet six pounds.

The Barred Plymouth Rock is noted as a farm fowl. They are great layers if properly bred, and are undoubtedly one of the best varieties being bred at the present time. The Black Javas and the American Dominiques were the two oldest varieties to originate in America, and the Barred Plymouth Rocks were next. The Barred Rocks combined the good qualities of the other two and soon far surpassed them in popularity. They were originated in the states of Massachusetts and Connecticut and are supposed to have some blood of the Java, Dorking and Dominique, as well as some

Asiatic blood. As originally bred, it is said that the variety lacked stamina, activity and general ruggedness, until some fighting game blood was introduced.

Some strains of Barred Plymouth Rocks are inclined to become too fat. Others keep in good flesh and are great layers of large brown eggs. This is simply a matter of selection and breeding. This variety is one of the best for caponizing because the cockerels can be distinguished from the pullets so early in life.

The Standard requires both male and female to be the same shade of color. The laws of Nature declare that in all birds with barred plumage the male must be lighter in color than the female. Then in order to produce Standard color in both the male and female you must provide two matings, one for exhibition pullets, and one for exhibition cockerels. In the exhibition pullet pen you are obliged to mate Standard colored pullets to cockerels lighter in color, but clearly and distinctly barred. In the exhibition cockerel pen it requires Standard or exhibition colored cockerels mated to very dark, but clearly and distinctly barred females. One such mating gives you exhibition pullets and the other exhibition cockerels. But this requires double the equipment, double the stock and double the labor to produce both exhibition cockerels and pullets. This is called double mating. But despite this fact and the fact that good clean barring is hard to breed true in this variety, it is still one of the best general-purpose fowls in the American Standard of Perfection. We are of the opinion, if the breeders would change the Standard and adopt the single mating system, that thousands of other fanciers, farmers and city lot poultrymen of limited means would take up this variety, who refuse to do so now because of the necessity of two yards.
CUT—Page 17

In attempting to breed Barred Rocks it is dangerous to cross different strains. You should select a reliable breeder to start with, and then if you have to buy either stock or eggs later to get new blood, be sure to go back to the same strain.

Mr. M. S. Gardner, who previous to his death was recognized as one of America's greatest Barred Rock breeders, had this to say about mating them:

"If the man who is just starting out to breed Barred Plymouth Rocks buys a pen of fowls mated for breeding and raises a number of chicks from the pen, he is sure to make the discovery, when they reach maturity, that the males are all much lighter in color than the females. If females raised from the pen are of Standard or exhibition color, then the males will be too light for exhibition; or if, on the other hand, the pen produces cockerels of Standard color and barring, the pullets will be much too dark for exhibition. This has been the case since Barred Plymouth Rocks originated. The Standard for Barred Rocks describes a male and a female of practically the same shade of color, but nature refuses to produce them that way from one pen or mating. After a number of years' experimenting along different lines and trying different methods of mating, the most successful exhibitors of this variety began to use the double mating plan, or a mating of dark birds to produce cockerels of the right color and character of barring, and a lighter mating to produce females of the clean color and barring so much admired in the show room.

"Our own cockerel mating pens are usually headed by our best exhibition males, or at least those that have been bred from a long line of exhibition males. We sometimes use a male that is darker than Standard if we know that his breeding is right. With this male of Standard color, or perhaps darker, we use females very dark in color and narrow in barring and bred from a long line of cockerel-bred birds. It is not enough that females should be dark in color. In order to be reasonably sure of results, they should be of the same line of blood as the male, and both should have been bred in line for a number of years. In other words, you should be able to trace their ancestry back to a long line of fine exhibition males. The Standard describes a bird with yellow legs and beak. We make no effort to breed our cockerel-bred females to Standard in color of either plumage, legs or beaks. Many of our best cockerel-bred females show no yellow in either legs or beaks, and those that do have black spots on both. In color of plumage, we prefer females so dark and narrow in barring as to show no white between the dark bars below the surface, or after the first three or four bars, and very little on the surface. On the lower part of the feather or for the last inch or so next the skin, we prefer to have the bars run together. From females of this kind, we get cockerels good in surface color, with good color in legs and beaks, and with barring showing distinctly to the skin. Cockerels bred from females that show white in under-color are very liable to be weak in under-color, and are often what we call 'cotton-backs.'

"In our mating to produce exhibition pullets, we use our best females of Standard or exhibition color. These females are the result of a number of years of careful breeding for good Plymouth Rock shape, narrow, clean-cut barring, and clean color. The males used in our pullet matings are of the same line of breeding, but much lighter in color than the females. While it is desirable to have the barring in a pullet-bred male as straight and regular as possible, it is not always desirable to have him barred to the skin like an exhibition male. If the females in the pen are good in under-color and barring, we prefer to use a male that is not too heavy in under-color. If a pullet-bred cockerel's mother and sisters are good in under-color and barring and of fine exhibition quality, we do not hesitate to breed from him, even if he shows considerable white in under-color of back and some in other sections. Pullets sired by such a male are more sure to be of a clean surface color than those sired by a male that is barred to the skin. A pullet-bred male, to be valuable as a breeder, should be of typical shape and should have very rich yellow legs and beak.

"In addition to the points above mentioned, both cockerel and pullet-bred birds should have red or bay eyes, and should be free from Standard disqualifications.

From the best matings, however, one must expect a large number of inferior birds, fit only for market purposes. This is true of all Standard breeds, and especially so of the parti-colored varieties. Comparatively few high-scoring exhibition birds are produced in any breeder's yard in any one season. I make this statement after having had the pleasure of visiting the plants of nearly all of the prominent Eastern breeders. The beginner

who expects 90 or 95 per cent of his chicks to live to be prize-winners and fine exhibition specimens will be sorely disappointed. The defect most often found, perhaps, in Barred Plymouth Rocks, is that of black feathers Even the best birds, especially females, usually have a number of black feathers in various parts of their plumage. But these are not alarming to the experienced breeder, as up to the present time it has been impossible to breed them out. In preparing Barred Rocks for the show room, however, it is always advisable to leave all black feathers at home.

"Never breed from either males or females showing positive white in ear-lobes or feathers on legs or feet. Occasionally a chick will hatch, from eggs from the most carefully selected pen of breeders, that at maturity will show white in ear-lobes or feathers on legs. It will still require years of careful selection in breeding to entirely breed out these tendencies inherited from a remote ancenstry.

"If you are just beginning to breed Barred Plymouth Rocks, do not buy your pen of females from one breeder and your male from another. Mating birds of two different strains of any parti-colored variety is an experiment that usually results in disappointment. It should be attempted only by the experienced breeder. The safer and surer plan is to buy stock or eggs from some one reliable breeder. If stock is purchased for best results, have the pen mated up by the breeder who raised the birds. The man or woman who begins breeding Barred Plymouth Rocks with one pen mated for producing fine cockerels and another pen mated to produce fine pullets, if these birds are line-bred and mated by a reliable and experienced breeder, is started on the right road to win the coveted ribbons in the Barred Rock aisle."

White in the ear-lobes would disqualify a Barred Rock. The shanks must be yellow. Red feathers in the plumage, two or more solid black feathers in the tail or in primary or secondary feathers of the wing will also disqualify.

Barred Plymouth Rocks have always made good records in egg laying contests, and won first prize two years in succession in the National Contest in competition with twenty of the leading varieties. It is one of the best varieties in the Standard.

In breeding Barred Rocks, or any white and black variety, the black should be black and the white, white without any intermixing. In both barred and mottled breeds there is a tendency for the black to spread. In Barred Rocks it runs or streaks into the white and gives the plumage a smutty appearance. It is necessary to have birds that are evenly and distinctly barred. The markings should be clear, and clean cut, and the bars should present a snappy appearance.

Single mating of Barred Rocks originally was the exclusive method of mating this variety but breeders in their experiments to produce better birds found that by using very dark females mated with exhibition males resulted in producing much clearer and snappier barred males although the females from such mating would be much too dark for exhibition purposes. On the other hand it was found that by using a very light, well barred male with exhibition colored females great improvement was made in producing clean, narrow barred females, but producing males much too light for exhibition purposes. Breeders followed this method of breeding for years and it was called Double Mating. It was the line of least resistance in producing color, but the trend was that one line; the cockerel line, kept getting darker every year until the males were of a smoky color and the females nearly black, the pullet-line going the opposite way and becoming too light. The best breeders saw where this indiscriminate mating would soon lead them but many of them through thorough and scientific methods of mating are now producing both exhibition males and females from the same mating.

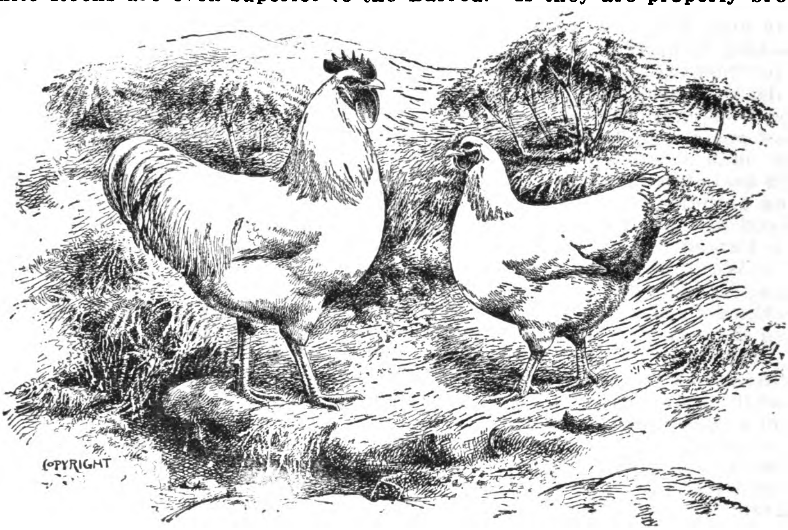
In order to get away from the troublesome problem of the double mating of Barred Rocks, some breeders of this variety are trying out the following plan: They take an exhibition colored male bird and mate him, we will say, with five dark colored or cockerel-bred females and the same number of exhibition colored females. From the first five females they secure their exhibition cockerels and from the last mentioned five females

they secure exhibition pullets. We are quite certain, however, that if these birds are selected and bred in this way, and the birds pedigreed for two or three generations, that both exhibition males and females could be produced from the one pen. When this plan is tried it is necessary to stay strictly within the same blood lines, and all birds must be pedigreed.

Another method from which good results have been obtained is to mate a rather dark, narrow barred pullet bred male, a bird that has good heavy under-color, to a number or rather light, narrow barred, cockerel bred females. Both males and females should have clean wing barring and the male should have good yellow beak and legs. From such a mating you may expect to raise both exhibition males and females.

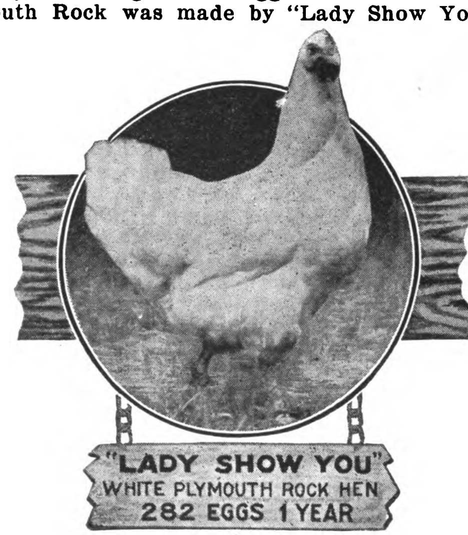
WHITE PLYMOUTH ROCKS

For market purposes, on account of the color of their plumage, the White Rocks are even superior to the Barred. If they are properly bred,



WHITE PLYMOUTH ROCK

they are great layers of large brown eggs. The best record ever made by a White Plymouth Rock was made by "Lady Show You," while in my



charge. This great hen laid 281 eggs as a yearling hen. No breed of poultry produces such uniformly good specimens in both male and female as do the White Rocks. This variety has but comparatively few imperfections, and many qualities of great merit. Many strains of this variety have a tendency to become overly fat and, therefore, do not lay as they should. This is caused by neglect in selection and breeding.

White Plymouth Rocks originated in Maine, and are said to have been hatched from Barred Rock eggs. They first appeared in 1875. The males were brassy and the females were creamy. Today they are being bred snow-white. Shape should not be sacrificed for whiteness, however. A deviation from the correct shape, or a break in the body lines of a White Plymouth Rock shows more plainly than in most any other variety. Beauty and utility are combined in this variety to a high degree. The plumage must be white, and any other color of feathers would disqualify. The legs must be yellow, while white in the ear-lobes would throw the bird out of competition, or disqualify it.

BUFF PLYMOUTH ROCKS

Buff Plymouth Rocks are good layers and are equal to the Barred and White varieties, as far as utility and market is concerned. If properly bred, they are beautiful birds. It is a difficult matter to retain the color in the plumage of the older birds. A very dark surface or a very light under-color is objectionable. Shafting and mealiness in plumage must be avoided. They are supposed to have originated in Massachusetts, from a Buff Cochin, and Light Brahma cross, or a combination of the White Rocks and the Rhode Island Reds. The correct description of the plumage is a rich golden buff.

In breeding buff birds of any variety, do not breed a male that shows red on wing bows. Do not breed from females showing considerable white in under-color of neck or other plumage.

Here, again, white in ear-lobes disqualifies, and the birds are required to have yellow shanks.

A cinnamon brown, or a tendency to black, which we find in buff varieties, seems to be found chiefly in the tail and wing feathers of such varieties. This would lead us to believe that the larger feathers have a tendency to draw out an over-plus of this dark pigment. Find a male and female that are as free from this defect as possible and then carefully line-breed. Great contrasts in the color of the sire and dam of the buff varieties will result in the mottled, mealy or patchy surface color. In breeding buff varieties, by all means eliminate light shafting from your male birds that head your breeding pens. If you breed from buffs with decided buff under-color, the surface usually has a tendency to reddish buff. If you breed from birds that have white under-color, the surface has what we call "lemon-shade." A rich golden buff is preferable.

BLUE PLYMOUTH ROCKS

Blue Plymouth Rocks are the latest addition to the Plymouth Rock varieties. As in the other varieties of Plymouth Rocks they are required to have yellow shanks, while white in ear-lobes would disqualify. The color of the plumage is described as a clear slaty blue, each feather laced with a darker blue. The male should be much darker on the neck, wing bows, back and saddle than the female, and if properly bred they are a creditable addition to the Plymouth Rock breed.

SILVER WYANDOTTES

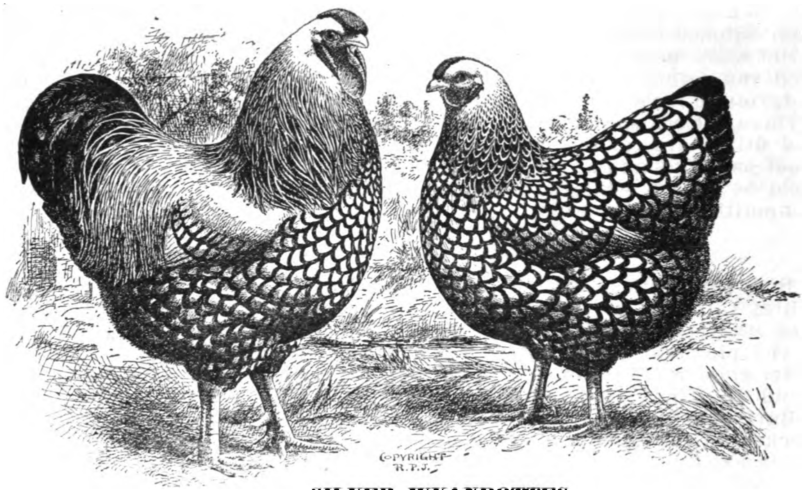
The Wyandottes belong to the American class because they were developed in America. They have Rose Combs and smooth shanks. There are eight varieties of the Wyandottes—the Silver, Golden, Silver Penciled, Partridge, White, Buff, Black and Columbian varieties.

The Silver color is formed from black and white, the black margin around the white center, while the Silver Penciled color is formed by the alternation of black and white stripes running around the feather the same as the Dark Brahma. The Golden and Partridge varieties correspond

with the Silver and Silver Penciled except that red or bay takes the place of the white.

The Columbian variety is marked the same as the Light Brahma.

The American Standard of Perfection weights for the cock and hen are 8½ and 6½ pounds respectively, while the cockerel and pullet weigh 7½ and 5½ pounds respectively.



SILVER WYANDOTTES

The Silver and White are perhaps the best known. The Silver Wyandotte breeders applied for admission to the Standard in 1877, but they failed because the specimens offered were pronounced unworthy of recognition, and it was not until 1883 that they were admitted. Their history or origin is not positively known. They seem to have some of the markings of the Light Brahma and the Silver Spangled Hamburg.

The Wyandottes belong to the dual or general purpose breeds, and

are very quiet and gentle. They are perhaps the best sitters and mothers of any of the varieties. Some strains of Wyandottes lay a great many eggs, which are small and irregular in shape, size and color. This is one of the greatest objections that can be found in this breed. This defect can

be bred out of them, however, and if a Wyandotte breeder will select eggs of uniform color and size for about two years he can notice a wonderful improvement. We have bred families of Wyandottes that laid as many eggs and just as large and as uniform eggs as any vareity of poultry possibly could.

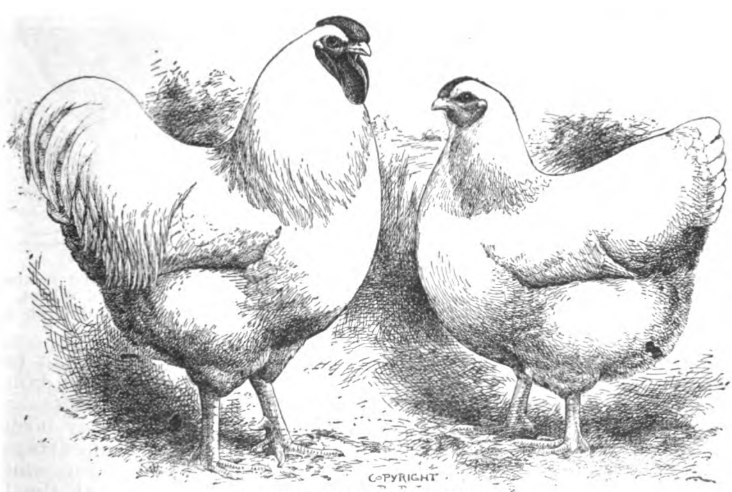
Wyandottes are beautiful in shape and color. They usually lay well in fall and winter. They do not mature quite as quickly as some other varieties. Their bodies are plump and both thighs and breast are well covered with tender flesh.

If a specimen of this variety had shanks that were not yellow, or had a very large per cent of white on the ear-lobes, it would be disqualified.

In selecting Silver Wyandottes, or laced males and females of any variety, if you will select birds where the small feathers covering the underside of the wings and the inside and back of the tail are well and clearly laced, you will find that the offspring from such matings nearly always have beautiful plumage, which is exceedingly well laced. In order to insure this, however, you must select birds with the lacing on the surface plumage as nearly ideal as possible; this is an infallible guide in mating and selecting breeders of any parti-colored variety. A female which has narrow lacing will seldom have mossiness in any section, and is more valuable for exhibition and for breeding. Pullets with narrow lacing usually hold their color and markings when they moult and are usually free from mossiness. Laced birds that have mossiness in the plumage is one sign of penciled, or off-colored blood in the ancestors. In selecting laced males, be careful to select birds with bodies and breasts that are as free from black feathers as possible, and the breasts should be completely and well laced to make a good breeder. Mossiness in the plumage of the females is inclined to produce black in the bodies of the males, and males with black in the breasts and bodies will produce mossiness throughout the plumage of the female. Bear in mind in mating laced varieties, that black breasts and mossy lacing are your most serious stumbling blocks on your road to success. When you find males with black breasts you will also find that they will usually have smut in shoulders and saddles; and, also, that they have defective wing markings, as a rule.

WHITE WYANDOTTES

The White Wyandottes are the most popular variety of this breed, due chiefly to their color. They originated as a sport from the Silver and were not created by crossing other varieties. It is quite a common thing today to find pure white chicks hatched from Silver Wyandotte eggs. The



WHITE WYANDOTTES

present White Wyandotte is one of the most popular fowls in the world, due to its capabilities as egg and flesh producers and as a show bird. Brassiness in the plumage and white in the ear-lobes are two of the greatest defects found in this variety, although at this time there are numerous flocks which with line breeding and careful selection have very little or no trouble with these defects. The male should have a short, strong, curved beak; broad, round head; well-curved rose comb; decidedly arched neck; U or saddle shaped back; broad though well curved tail; short, sturdy thighs; full and well-rounded breast. The female should have similar lines, except for a slight cushion on the back line. The Standard weight for adult males is eight and a half pounds. Overweight or underweight destroys the full curved lines so essential to a true Wyandotte.

We have owned several birds of this variety that laid over 270 eggs each. We have had flocks that averaged 180 eggs per hen. The young birds do not develop quite as rapidly as some other breeds, and every breeder of this variety must strive to improve the uniformity of the size and color of the egg by selection and breeding. They have won several years in egg laying contests.

Here, again, white ear-lobes, foreign colored feathers, or shanks which are not yellow will disqualify.

Black feathers, white feathers splashed with black or small spots of black, called ticking, are often found in white birds of all varieties. These are but the sign of dark colored ancestors from which these white varieties sprang. This is no indication that the bird is not pure-bred. If the white varieties lack sufficient shade in summer months, that has a tendency to

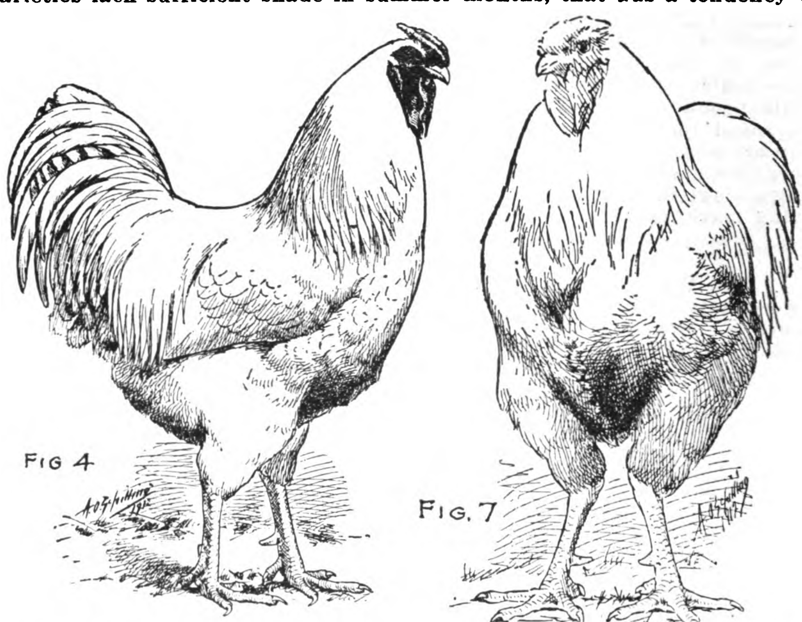
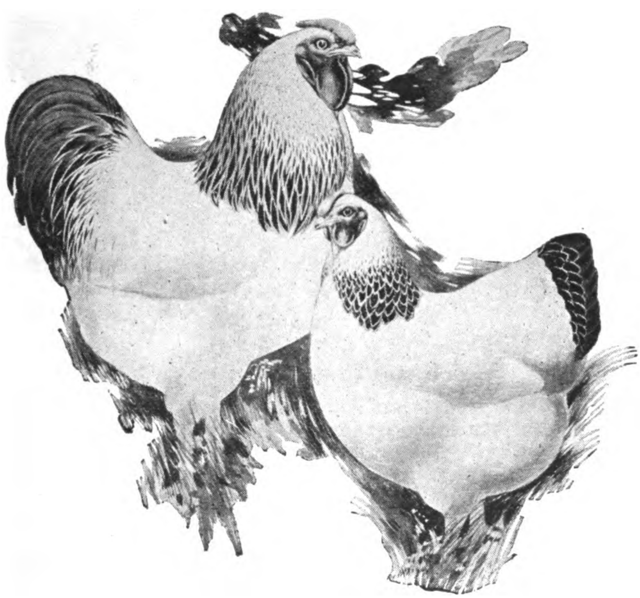


Figure 4 shows a very poor specimen of Wyandotte. The bird is too high on legs and too slender in body. Fig. 7 shows a knock-kneed bird which shows signs of weakness which should be avoided in any specimen, and such a male should never be used for breeding.

produce brassiness, or sunburned effect. If the young stock can be kept in the hot summer months in a valley where the air is a trifle damp and where there is an abundance of shade, it will add lustre, whiteness and beauty to the plumage. In choosing breeders, if you find any birds that have creamy or yellow under-color but with a clear white surface, and you find another male with brassy surface but pure white under-color, it is always best to use the first mentioned male in preference to the latter.

A brassy surface can never be removed, and has a tendency to show in the offspring, while creamy under-color in birds is usually caused by too much oil in the feathers. This may be washed or bleached out.

COLUMBIAN WYANDOTTES



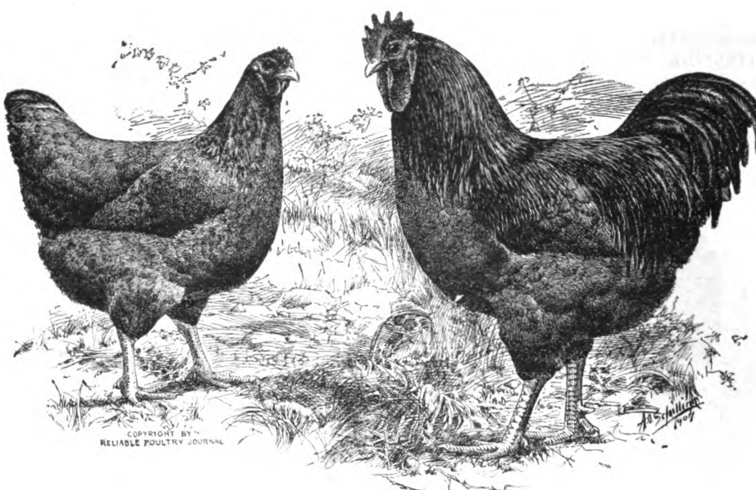
Nearly twenty years before this variety was admitted to the Standard, there appeared in New Hamphsire a fowl called "Clean-leg Brahmas." They were practically like the Brahma in color but were shaped more like a Wyandotte. This variety is undoubtedly a cross of a Light Brahma and some white fowl. At the time this variety was originated, Light Brahmas were in the height of their glory and the most popular fowl in America. At that time, everyone said that a Light Brahma without leg and toe feathers was a hideous thing and the Columbian Wyandotte was thus looked

upon. This variety has practically all the good points of the Silvers and Whites.

This variety resembles the Light Brahma as far as color of plumage is concerned, and the same disqualifications apply as in case of the plumage of Light Brahmas hereinafter mentioned. Columbian Wyandottes must also have yellow shanks and are disqualified if they do not have them.

In breeding Columbian Wyandottes, Columbian Plymouth Rocks or Light Brahmas, the under-color seems to play the most important part in the proper distribution of the black and the proper markings in the various sections. The Standard requires a bluish slate under-color, but if you select breeders with clear white under-color, the hackle and primaries of the offspring, as a rule, will be too light. Also, birds of these varieties with white under-color have a tendency to brassiness on the male and creaminess on the female. And if the under-color is slate without much white, the birds will have smutty hackles, too heavy striping in saddles, black peppering on wing bars, black on breast feathers, and in many cases a tendency to brassiness. The best under-color is a bluish slate next to the web of the feathers. These last mentioned birds usually have clean cut and well marked feathers that meet Standard requirements, and they are usually free from brassiness. This applies to Columbian Wyandottes, Light Brahmas and Columbian Plymouth Rocks.

S. C. RHODE ISLAND REDS



S. C. RHODE ISLAND REDS

The Rhode Island Red is an American breed. It was originated in the United States and bears the name of the state where it originated.

There are two varieties, the Single and Rose Comb. The Single Comb is shown in the illustration and the Rose Comb variety is the same as the Single Comb, with the exception of the Comb.

The color of the two varieties should be the same, red with black markings on the wings and tail.

The Rhode Island Reds are becoming one of the most popular of the general purpose breeds. They are rivaling Barred Plymouth Rocks for first place in popularity as a farm fowl.

They have long bodies and smooth yellow legs. They belong to the dual or all-purpose breeds, as they are good table fowls and also good egg producers. They are one of the best all-purpose varieties.

The American Standard of Perfection weight for the cock is 8½ pounds; the cockerel weighs 7½ pounds. The hen weighs 6½ and the pullet 5 pounds.

For practically fifty years red fowls were bred in the Rhode Island

and Massachusetts farming sections before these birds were taken up by fanciers and really recognized as a breed or variety. At the beginnnig they were more on the order of a reddish buff rather than a deep, brilliant red as they are now bred. Nearly all of the earlier specimens had what we call "pumpkin necks"—yellowish in color.

The modern Red is a beautiful, even-colored, brilliant red from head to tail. The wings and tail should have black markings as called for in the Standard. The breed is supposed to have some game blood in its make-up; also something of the Buff Cochin and Leghorn.

The red color is rather difficult to breed, so that a large per cent of any flock will be uniformly high-class specimens. The old birds fade in color after the first season.

The Single Comb Reds mature quickly, are very hardy, and are very good layers of large brown eggs. They do not lay quite as well, as a rule, as the Rose Comb Reds, but their eggs are usually more fertile.

One-fourth white in the ear-lobes, a white feather in the outer plumage, or off colored shanks will disqualify a Rhode Island Red.

The Rhode Island Red Club gives the requirements for the various sections of the Single Comb and Rose Comb Reds as follows:

Shape of Male

Head—Of medium size and breadth, carried in a horizontal position and slightly forward.

Beak—Medium length and regularly curved.

Eyes—Sight perfect, and unobstructed by breadth of head or comb.

Comb—Single, medium in size, set firmly upon the head, perfectly straight and upright, with five even and well defined serrations, those in front and rear smaller than those in the center, of considerable breadth where it is fixed to the head.

Comb—Rose, low, firm on the head, top oval in shape and surface covered with small points terminating in a small spike at the rear. The comb to conform to the general curve of the head.

Wattles—Medium and equal in length, moderately rounded.

Ear-Lobes—Fairly well developed. Symmetry of proportion in head adjuncts is to be considered.

Neck—Of medium length and carried slightly forward. It is covered with abundant hackle, flowing over the shoulders, but not too loosely feathered.

Back—Broad, long and in the main nearly horizontal; this horizontal

effect being modified by slightly rising curves at hackle and lesser tail coverts. Saddle feathers of medium length and abundant.

Breast—Broad, deep and carried in a line nearly perpendicular to the base of the beak; at least, it should not be carried anterior.

Body—Broad, deep and long, keel-bone long, straight and extending well forward and back, giving the body an oblong look.

Fluff—Moderately full, but feathers carried fairly close to the body, not a Cochin fluff.

Wings—Of good size, well folded and the flights carried horizontally.

Tail—Of medium length, quite well spread, carried fairly well back, increasing the apparent length of the bird. Sickles of medium length, passing a little beyond the main tail feathers. Lesser sickles and tail coverts of medium length and fairly abundant.

Legs—Thighs large, of medium length and well covered with soft feathers. Shanks of medium length, well rounded and smooth.

Toes—Straight, strong, well spread and of medium length.

Color of Male

Beak—Red horn color, or yellow.

Eyes—Red.

Face—Bright Red.

Comb, Wattles and Ear-Lobes—Bright Red.

Neck—Red, harmonizing with back and breast.

Wings—Primaries: lower web, black; upper web, red. Secondaries: lower web, red; upper web, black; flight coverts, black; wing bows and wing covers, red.

Tail—Main tail feathers and sickle feathers, black or greenish black. Tail coverts mainly black, but may become russet or red as they approach the saddle.

Shanks and Toes—Yellow or red horn color. A line of red pigment down the sides of shanks is desirable.

Plumage—General surface rich brilliant red, except where black is specified. Free from shafting, mealy appearance or brassy effect. Depth of color (red) is slightly accentuated on wing bows and back, but the least contrast between these parts and hackle or breast the better; a harmonious blending is what is desired. The bird should be so brilliant in luster as to have a glossy appearance. The under-color and quill of the feather should be red or salmon. With the saddle parted showing the under-color at the base of the tail, the appearance should be red or salmon, not whitish or smoky. Black or white in the under-color of any section is undesirable. Other things being equal, the specimen having the richest under-color shall receive the award.

Shape of Female

Head—Of medium size and breadth, carried in a horizontal position and slightly forward.

Beak—Medium length and slightly curved.

Eyes—Sight perfect, and unobstructed by breadth of head or comb.

Comb—Single, medium in size, set firmly upon the head, perfectly straight and upright, with five even and well-defined serrations.

Comb—Rose, low, firm on the head, much smaller than that of the male and in proportion to its length narrower. Covered with small points and terminating in a small short spike to the rear.

Wattles—Medium and equal in length, moderately rounded.

Ear-Lobes—Fairly well developed. Symmetry of proportion in head adjuncts is to be considered.

Neck—Of medium length and carried slightly forward. Hackle sufficient, but not too coarse in feather.

Back—Long, in the main nearly horizontal. In the completely matured hen it would be described as broad, whereas in the pullet not yet well matured it will look somewhat narrow in proportion to the length of her body. The curve from the horizontal back to the hackle or tail should be moderate and gradual.

Breast—Deep, broad and carried in a line nearly perpendicular to the base of the beak; at least, not anterior to that line.

Body—Deep, broad and long, keel bone long and straight, giving body an oblong appearance.

Fluff—Moderately full, but not too loose (Cochin) in feathering.

Wings—Of good size, well folded and the flights carried horizontally.

Tail—A little shorter than medium, quite well spread. The tail should form no apparent angle with the back, neither must it be met by a high rising cushion.

Legs—Thigh of medium length and well covered with soft feathers. Shanks of medium length, well rounded and smooth. Toes straight, strong, well spread and of medium length.

Color of Female

Beak—Red horn color, or yellow.

Eyes—Red.

Face—Bright Red.

Comb, Wattles and Ear-Lobes—Bright Red.

Neck—Red. The tips of the lower hackle feathers should have a black ticking, not a heavy lacing.

Wings—Primaries: lower web, black; upper web, red. Secondaries: lower web, red; upper web, black; flight coverts, black; wing bows and wing coverts, red.

Tail—Black or greenish black.

Shanks and Toes—Rich yellow or red horn color.

Plumage—General surface color lighter and more even than in the male, free from shafting or mealy appearance. Except where black is specified the color is a rich even shade of bright red, not as brilliant in lustre as the male. The under-color and quills of the feathers should be red or salmon. Black or white in the under-color of any section is undesirable. Other things being equal, the specimen having the richest under-color shall receive the award.

The above description is not worded exactly the same as that in the Standard of Perfection. The Standard gives similar requirements and descriptions of every variety of poultry, and it is necessary to have a Standard to be able to judge or select any variety with any degree of accuracy.

ROSE COMB RHODE ISLAND REDS

The Rose Comb Rhode Island Reds should be the same weight, color and shape as the Single Comb Reds. The disqualifications are the same as for the Single Comb varieties except comb. They are a little better layers than the Single Comb birds, but are harder to breed true to shape. For some unknown reason we have always had more difficulty in getting a good per cent of fertility from Rose Combs than from Single Combs. This is generally true with all Rose Comb varieties, but we are of the opinion that it is due chiefly to the manner in which they have been selected and bred. The prepotency of the breeding stock, in all cases, must be given careful consideration by the breeder. The Rhode Island Reds are one of the best all-purpose fowls.

In mating Rhode Island Reds a little smut in the under-color of the breeding stock, either in the male or female, but generally not in both without you know your line and just how to mate, will do no particular harm, if the birds are strong in other points and carry a good rich surface color. You will make a mistake to discard a good breeder simply because it has little smut. In fact, it is sometimes necessary to carry a little smut in order to get the correct amount of black markings in the wing and tail. We would much prefer smut to white in neck, wing, saddle or tail feathers. It is easier to handle smut than it is to breed out white. A good rich, red under-color is to be desired.

Type is of greatest importance. Mate your breeding pens so they will be as uniform in size and color as you can get them. Never use a light colored male, or one with a "pumpkin neck." Don't use birds for breeders that are of a dull chocolate color; a dark, deep, brilliant red is

most desired. A bird that has four or five shades of red in the plumage should not be used. If you find a good breeder, hang to him. It is hard to breed a uniform good flock of Reds if you are continually changing strains. Careful inbreeding or line-breeding can be practiced to good advantage in holding the color of this variety. What applies to one variety of Reds, applies to the other.

The Secretary of the Rhode Island Red Club, Judge Card, had this to say regarding Reds:

"The Rhode Island Red shape, according to the Standard, is an oblong poised horizontally; the back forming a horizontal line from neck to tail. The stern is no lower than the front breast curve. Strong, prominent thighs are set exactly under the center of the body, to preserve the poise. The tail should raise to about the angle the neck would assume if the bird were in the act of reaching out, or at an angle of forty degrees.

"The Rhode Island Red is positively man-made, especially in the color scheme. Today the most troublesome defect is what is called "shafting"—that is, a light red or yellow shaft to each feather, which mars the even shade of red; this has been traced to breeding from males with a black stripe in the hackle having also this objectionable yellow shaft. Another defect present in many females is a black-peppered surface at the shoulders and wing bows; this is the result of using breeders with abundant black pigment or slate in the under-color. These defects are yielding to the influences of well-directed color mixing and careful breeding and are now found only on birds of short pedigree."

In breeding Rhode Island Reds, or any buff variety, it is a mistake to mate a bird of dark shade to one of light shade, or vice versa. In the offspring of all such matings you will find a motley array of the light and dark colors intermingling throughout the plumage. The best method is to take a male of uniform surface color and match his breast and body color with the surface color of the females. The females must be an even color throughout for best results. If this manner of mating your birds is continued for two or three years, you will find that they will produce most excellent results and you will soon have the colors desired securely blended and fixed in your flock. A light red under-color is not lasting, and in the second moult you will nearly always find white patches throughout such under-color. Such birds will always have weak and changeable surface color. Black stripes in the hackle of the young male never moult out, but the small black tips, which we sometimes find at the base of the hackle, will practically always moult out. If they do not moult out the first year, the adult male plumage seldom have it. A cockerel with such markings in his plumage will usually prove to be a breeder of pullets with hackles which contain like tips. If you use a male with permanent black stripes in the hackle you will find that nearly all of his pullets have entirely too much black in their hackle. Never use a red or buff male bird with shafting in the plumage. Females from such sires will always have body, back and breast plumage disfigured by this light shafting. If you find a Rhode Island Red or Buff bird where lacing shows on the edge of the feathers, this is an indication that the male and female from which your bird was bred were too far apart in color tone. Careless selection and bad breeding often result in "pumpkin necks." White feathers in the plumage or white under-color is more dangerous in breeding Rhode Island Reds and Buff varieties than is a surplus of black.

BUCKEYES

Buckeyes originated in Ohio. They are a cross of Cornish, Buff Cochin, Barred Plymouth Rocks and Game. They have a pea comb. They are somewhat more of a chocolate color than the Rhode Island Reds. They are about midway between the Cornish and Reds in shape. They are not quite such good layers as Reds. The cock weighs 9 pounds, cockerel 8 pounds, hen 6½ pounds and pullets 5½ pounds.

An entirely white feather in the plumage, or an ear-lobe covered by more than one-fourth positive enamel white would disqualify a specimen of this variety.

THE "CHANTECLER"

This variety of fowls was admitted to the Standard of Perfection in 1921.

This breed was originated at LaTrappe, Quebec, Canada, and is the only distinctly Canadian breed in the American Standard of Perfection. In obtaining this breed a number of crosses were used, with the object in view of getting a fowl that would be a good layer, a fowl that could stand the long, cold winters and one that would mature quickly for marketable purposes, in fact a good general purpose fowl.

To obtain this fowl, Wyandotte, Rhode Island Red, Cornish, Leghorn and Plymouth Rock blood was used and the result of careful breeding and painstaking effort has been the production of a splendid variety of fowl somewhat resembling the Cornish in type and a splendid winter layer. In general character the Chantecler should have a large but short skull, on which is set a small smooth comb like a cushion. Comb should be perfectly free from any spike and be square both in front and rear. Wattles and ear-lobes should be small and of smooth texture. The Chantecler is a rather tight feathered bird and looseness of feather in any part of the body is a defect.

In color the beak should be yellow. Eyes—Reddish bay; Comb, Face, Wattles and Ear-Lobes—Bright Red. Shanks—Yellow. Plumage in both male and female pure white.

Disqualifications for this variety are as follows:

White in ear-lobes, one or more feathers foreign to the breed; comb that is not cushion shape; legs other than yellow in color and stubs or down on shanks or toes. Standard weights are: Cock, 9 pounds; cockerel, 8 pounds; hen, 7 pounds, and pullet. 6½ pounds.

This variety belongs and is placed in the American Class.

ASIATIC CLASS NO. 2

BREEDS	VARIETIES
Brahmas	Light Dark
Cochins	Buff Partridge White Black
Langshans	Black White

There are three breeds and eight varieties in this class.

LIGHT BRAHMA

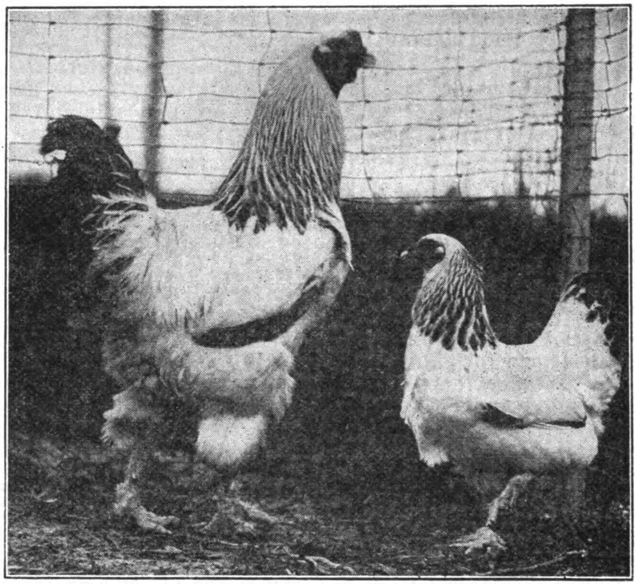
The Brahma breed was developed in China and placed in the Asiatic class because of having come from Asia.

There are two varieties of the Brahma breed. One is the Light and the other the Dark. The Light Brahma is illustrated here. It has a pea comb, feathers on the shanks, and its color is composed of black and white. The tail and wing feathers are principally black and the neck feathers have a black stripe in them, while on the rest of the body the feathers are white except the under-color, which may be slate. The color has been reproduced in the Columbian Plymouth Rocks and Columbian Wyandottes.

The Brahma being one of the largest fowls makes it one of the best for meat production when large birds are desired. The American Standard of Perfection weight for the cock is 12 pounds, the cockerel 10, hen 9½ and pullet 8 pounds.

They lay a rich brown colored egg, and some specimens of this variety are reported to have made records around three hundred eggs. Most

strains do not lay as well as the general purpose and smaller breeds. On account of their size they make great capons, which are sold in some markets for young turkey hens. They are beautiful birds and a flock of Light Brahmas always attract attention and bring forth favorable comment. It is the ambition of nearly every fancier, some time in his life, to breed this variety.



Light Brahmas have formed the foundation blood of many other varieties, and the poultry industry owes much to this wonderful old bird. It is undoubtedly one of the very best of the large breeds.

Mr. John Rumbold, Secretary of the American Light Brahma Club, is best qualified to speak as to the proper method of mating Light Brahmas, and we quote as follows:

"Never select a short limbed male as a breeder. He should be up to or over Standard in weight. I have not found it advisable to depend on the females to give size; the male is as much responsible for size in the progeny as the female, and no matter how large the hens may be, if the male is an undersized bird, there is no reason to expect the chicks to be large. A male must be bright and active if he is to be a good stock getter; a fowl that is always looking for a pleasant spot to rest himself will be a disappointment to his owner when he rounds up the product of the season. He must also be strong in color. There is a certain waste in color. Some of the chicks may be darker than the parents, but taken as a whole, they usually run a shade or two lighter. A strong colored bird is more attractive, especially in the show room, where one weak in any section shows to a great disadvantage, and if we are to keep the strong color points we must select birds we use as breeders that are especially strong in this regard. Then to sum up, our male bird must be a large, reasonably tall, long bodied bird, strong in color and with well feathered legs and toes, active, on the alert and vigorous. Such a bird will, with females that are his equal, give a good account of himself.

"In females, size should never be disregarded. Like will produce like. Small hens, small chicks. A large male may help to some extent, but cannot do all to make up for this deficiency. You should always select hens somewhat over the average in length of body—they are usually the best layers in the flocks—legs long enough to take them around at a lively gait when necessary, active, alert and always on the go. Color should

be as described in the Standard save wing primaries; there we say black, with narrow edging on lower web. That is a more handsome wing and a long ways ahead of the wing called for in the Standard. Legs must be heavily feathered; no half way business will do with leg feathering. This seems to be one of the most commonly reproduced faults of the breed. Shall we inbreed, line breed, outcross, or how best mate our birds for best results in the progeny? The line breeding charts that are printed now and then may be of use to the ones who study them up, but not to the general breeder who has from one to five yards each season; consequently the small breeder cannot carry out the line breeding system as thus illustrated. I am not a believer in continued close inbreeding; a certain amount of inbreeding is advisable, but selection must be made with care. Any noticeable fault will likely be reproduced in a greatly aggravated form, but one thing I cannot advise—turning down related birds that are fine to make room for an inferior specimen of different strain; the related birds would likely produce better results. Some of the best birds I have ever raised have been from brothers and sisters mated together. Breeders are supposed to have the same end in view—all of them—when

DARK BRAHMAS

they are mating up their breeding pens—pens that are producing Standard stock. Consequently all are more or less breeding along the same lines, and there is not the same probabilities and danger of unsatisfactory results at the present time as there were years ago. Again, most breeders are buying birds wherever they find them suited to their wants, until almost every breeder's birds are more or less related. I would, to make it plain and short, breed from the best birds I could secure, whether near related or not, preferring considerable of the same strain of blood in male and female. I question if inbreeding with careful selections has ever caused a flock of birds to deteriorate in size or stamina.

"Our selections of females for the breeding yard should be confined

to hens that have been great layers, or pullets bred from them. Don't get ruffled—but the Brahmas are not the layers they once were; breeding for color of feather and away from the longer, more active type of bird has done the breed a grievous injury. It must be overcome by breeding from the hens that lay best. It can be done. Why not do it?

"For color matings the best is a male a shade or two darker than Standard colored females, and the best females are those which have gone through an adult moult and have retained their color. Many hens lose in color after moulting; these should be discarded from the breeding pen under all circumstances.

"A very dark male mated to hens poor in color points, or a light male mated to hens too dark for Standard requirements will often produce good results, but are not to be used when the first stated matings can be made. Extremes in color matings will not as a general rule give satisfactory results.

"After your selections are made, get out and double the size of your breeding yards. If you are breeding only Light Brahmas, give each yard a run outside on stated days. It has as much to do with the fertility of the eggs as any one thing. Fowls, no matter how well mated, cannot do their best confined in small yards. It is against nature. And many failures have and will result from contracted yards. It makes hens lazy and incapable of caring for themselves when turned out after the hatching season is over."

If a specimen of this variety had shanks any color but yellow it would be disqualified. Neither should it have vulture hocks. A female would be disqualified if it had solid black or brown feathers on the surface of the back; or solid black spots in web of back feathers of either sex.

The Dark Brahma also belongs to the Asiatic class because of having originated in Asia. It has the same shape as the Light Brahma, but each bird, according to American Standard of Perfection, should weigh one pound each less than the Light Brahma.

In color the Dark Brahma is composed of black and white, the same as the Light variety, but the two colors are differently arranged. The black is about the same in the tail, wings and neck as in the Light variety, but the white is a silvery white instead of a pure white, and the markings on the rest of the bird are different. The female has black lines running around the feathers following the shape of the feather. These lines should alternate with silvery gray lines of the same width. This is called penciling. The male's body, breast and wing bows are black, while the back is silvery white.

The color of the Dark Brahma has been duplicated in varieties of Plymouth Rocks and Wyandottes, which are called Silver Penciled varieties. Very little is known as to what crosses were made to produce the Brahma breed.

A bird of this variety would be disqualified for vulture hocks or legs any other color than yellow.

COCHIN

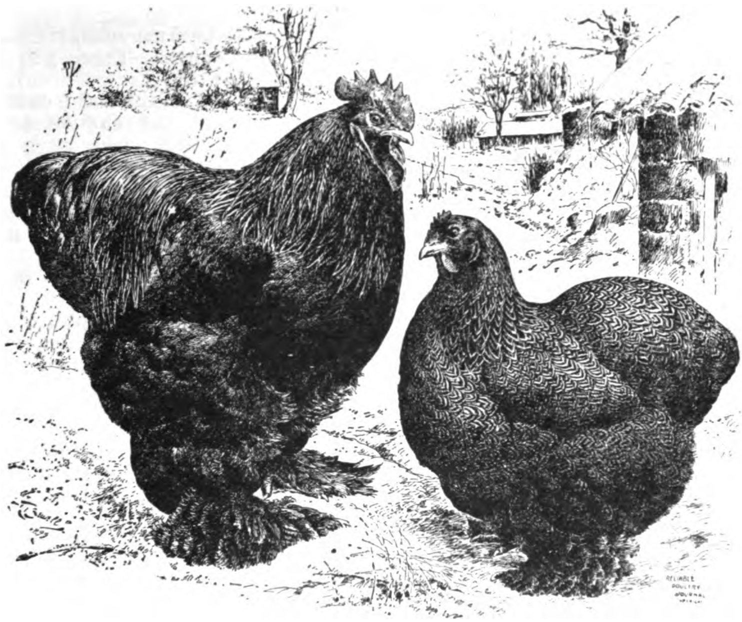
The Cochin breed, like the Brahma, was developed in China; therefore, for the same reason, it belongs to the Asiatic class.

There are four principal varieties of the Cochin breed, namely, the Black, White, Buff and Partridge. Each variety has a single comb and feathered shanks.

The Black, White and Buff need no comment, for the variety name tells their color. The Partridge color is made of black and red or brown. The arrangement of the colors is very similar to the arrangement of the colors of the Dark Brahma, the red or brown taking the place of the white.

The Cochin is the blockiest and heaviest looking built fowl we have, but the Brahmas exceed it in weight. It is generally considered a meat breed. The American Standard of Perfection weight for the cock is 11 pounds; cockerel, 9; hen, 8½; pullet, 7 pounds.

The Buff variety is perhaps the best known at this time, but the Partridge has also been quite popular.



PARTRIDGE COCHINS

The Cochin is a loose feathered bird. As a rule, they are not extra good layers, yet we have had some pullets of this variety which laid nearly 200 eggs. A three-foot fence will confine them. Their feet and shanks are profusely feathered.

If a Cochin had a middle toe which was not feathered, or hocks which were vulture-like, or which had been plucked, it would be disqualified. They are also required to have yellow shanks.

BUFF COCHINS

BLACK LANGSHANS

The Langshan also belongs to the Asiatic class because of having originated in the same country as the Brahma and Cochin. There are only two varieties of Langshans, the Black and the White.

The Langshans have single combs and feathered shanks, the same as the Cochins, but do not have so many feathers on the shanks as the Cochins.

The Cochin was described as being the blockiest of all breeds. The Langshan in contrast is the tallest of all breeds, standing very high and straight.

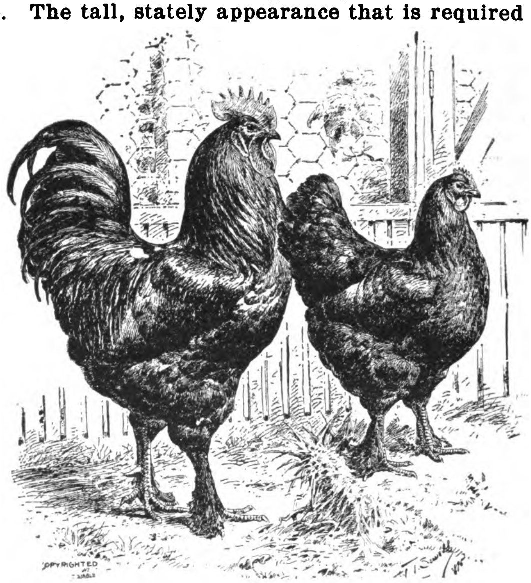
The Langshan is usually classed as a meat breed, but is also noted for winter egg production.

The American Standard of Perfection weight for the cock is 9½ pounds; cockerel, 8; hen, 7½, and pullet, 6½ pounds.

The Black variety shown in the illustration is the most popular. They lay brown eggs of richer color than any other variety. We have had a number of pullets to lay more than 200 eggs per year. The greatest objection which has been offered to this variety is the color of the plumage, for some people object to the black pin-feathers. We consider it one of the best of the large breeds.

If a specimen of this variety had yellow skin or yellow on the bottom of its feet it would be disqualified. A feather in any part of its plumage that is white for one-half inch or more in length except in foot or toe feathering will also disqualify.

In some sections they caponize the Langshan cockerels and they sell readily as young turkey hens at holiday time. They are known as "The Lordly Langshan." The rich green sheen of their plumage presents a striking appearance. Purple in the plumage or a brownish tinge is very objectionable. The tall, stately appearance that is required by the Stand-



BLACK LANGSHANS

ard should not lead you to breed from a spindling that is lacking in vitality and strength. See that your breeding birds have large bones and some size and depth of body.

Purple barring in Black Langshans, Black Orpingtons, Black Minorcas and other black varieties bear the same relation to black varieties as brassiness does to white birds. It is sometimes the result of lack of care and ill health, but is more often due to the fact that the birds have not been carefully selected and mated so as to eliminate this defect from the flock.

It also might be due to the influence of new blood. When you find black birds with a brown, dingy cast to the plumage underneath the wings and in the under-cover or surface color of the fluff, such birds should be eliminated from the breeding pens. We do not refer to the brownish tinge which is sometimes seen just before the bird's moult, and which should be looked for just before the breeding season, or about mid-winter. White or grav feathers in the wings or tail, or black feathers are usually caused by injury, lack of vitality or an imperfect moult. A red feather found in the plumage of black birds is not an indication of impurity, although in some breeds it is a disqualification. When you find black birds with a lot of purple in their plumage, you will usually find a tendency to yellow skin or legs. While this may not be very evident, yet in most cases you will find small spots on the bottoms of the feet or about the body of the bird. The chicks from most black varieties have black and white in about equal proportions at the time they are hatched, and they retain this color until they are feathered.

MEDITERRANEAN CLASS NO. 3

BREEDS	VARIETIES
Leghorns	Single Comb Dark Brown Single Comb Light Brown Rose Comb Dark Brown Rose Comb Light Brown Single Comb White Rose Comb White Single Comb Buff Rose Comb Buff Single Comb Black Silver Red Pyle
Minorcas	Single Comb Black Rose Comb Black Single Comb White Rose Comb White Single Comb Buff
Spanish	White Faced Black
Andalusians	Blue
Anconas	Single Comb Rose Comb

It will be seen that there are five breeds and twenty varieties in the Mediterranean Class.

SINGLE COMB WHITE LEGHORNS

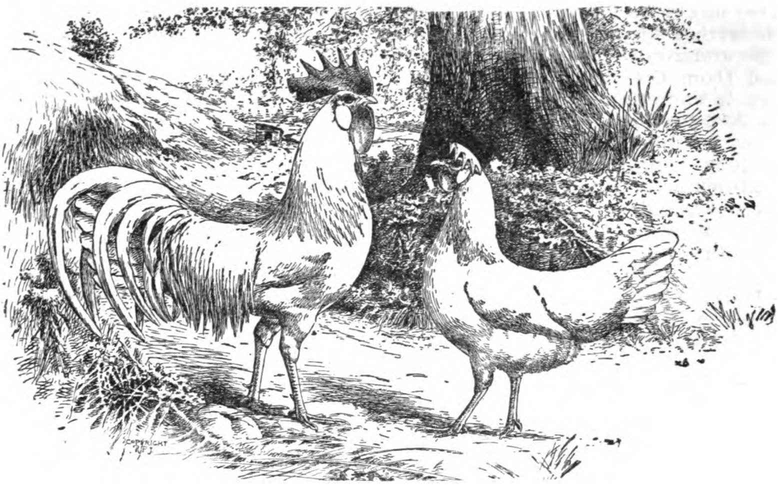
In direct contrast to the large Asiatic breeds we have just studied, we will now study the small, nervous Mediterranean class.

The Leghorn which is shown in the illustration belongs to the Mediterranean class, because it originated in the countries around the Mediterranean Sea.

There are eleven varieties of Leghorns. They vary in both color and shape of comb, there being both Single and Rose Comb White, Buff and Brown, and Single Comb Silver, Black and Red Pyle.

They are small and active and of a nervous temperament. They weigh from 3½ to 5½ pounds each. They lay large white-shelled eggs in great numbers, and for this reason are classed as being an egg breed. They have large combs and smooth shanks.

The Single Comb White, Single Comb Buff and Single Comb Brown are perhaps the best known varieties.



The American Standard of Perfection weight for the cock is 5½ pounds; cockerel, 4½ pounds; hen, 4 pounds; and pullet, 3½ pounds.

This is America's business fowl. They are used more extensively on paying commercial egg farms than any other variety. The white egg is in growing demand, and Leghorns produce eggs about as economically as any other breed. The white egg brings a premium in some markets. For beauty and utility the Leghorns are hard to excel.

One advantage which Leghorns have over the larger breeds is the fact that a larger per cent of their eggs are fertilized, as a rule, and a larger per cent usually hatch. There is not such a loss in incubation. The young mature rapidly and reach broiler age, a pound or a pound and a half, as quickly, or more so, than most other breeds. At that age they are also very tender and finely flavored. They also feather quickly and dress up

nicely and make a plump carcass at an early age. The poultry buyers and fattening stations despise Leghorns because most breeders hold their cockerels until they are staggy and the females are small in size.

White Leghorns are great layers. They usually lead in most egg laying contests. The best record has been 326 eggs in one year. These birds

stand confinement well, but are also great foragers if given their freedom. They are not suited for a city lot unless kept confined. We do not hesitate to recommend White and Buff Leghorns as among the very best for commercial egg farms. They do not lay as well in fall and winter as Plymouth Rocks, Wyandottes, Reds or Orpingtons.

They are ranked as non-sitters; however, many of them go broody. A tendency to a squirrel tail is one of the greatest defects found in Leghorns.

If a cockerel or a pullet has ear-lobes that are more than one-third red, shanks any other color than yellow, any feather that is not white, or positive white in the face of a cockerel or pullet, the specimen will be disqualified.

SINGLE COMB BUFF LEGHORNS

We consider the Buff Leghorns just as good as White. Of course you will have a little more trouble in maintaining the Buff color. They have a tendency to white tail and wing feathers, light under-color, or a reddish surface in some cases. But they are a beautiful variety and have all the good points of the White Leghorn. They develop very rapidly. Five Leghorns can be kept in the same house and space that will accommodate four of the larger breeds. It will require about the same feed for five Leghorns as for four larger birds. When they are sold on the market, the five Leghorns will usually weigh as much as the four larger birds. When they are served on the table you have either more meals or else more choice pieces of chicken. Leghorns have a finely grained flesh, which is highly flavored. They have rather plump breasts, considering the size of the bird. They have their share of objectionable points, but they also have many things to commend them to poultry raisers.

The same defects disqualify a Buff Leghorn as those mentioned for the White, except that the Buff is required to have a rich golden buff plumage.

SINGLE COMB BROWN LEGHORNS

The Single Comb Brown Leghorns contain many of the good points of the White. Until the last few years, in order to produce Brown Leghorn males and females of Standard color, breeders resorted to the system

of double mating. By mating an exhibition colored male to a very dark stippled, or penciled female the richness of coloring and striping in the male progeny was intensified and beautiful color obtained. On the other

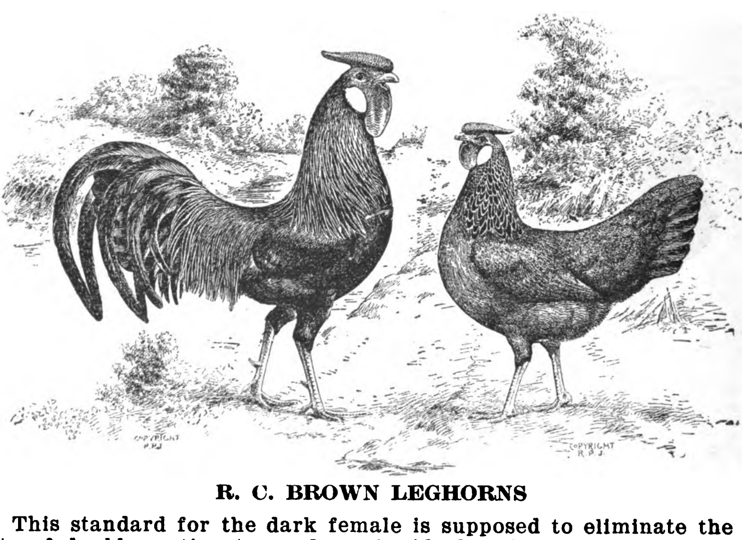
hand breeders found that by mating the exhibition colored female to a light orange or lemon colored male the beautiful soft shade of brown so desired in the female was obtained. The double mating of this variety was carried to such an extreme, that eventually the male and female line got so far apart that they became practically the same as two separate and distinct varieties. In 1919 the American Brown Leghorn Club asked and obtained permission to have them placed in the Standard of Perfection as two separate varieties and the latest edition of the Standard has the two varieties—S. C. and R. C. Dark Brown Leghorns and S. C. and R. C. Light Brown Leghorns. The Brown Leghorns have not proven to be quite such good layers as the White Leghorns, but this is again a neglect in selection and breeding. Breeders of this variety have too often strained a point to get the color and neglected egg production. However, this is being corrected.

"As in all varieties of the breed, the beak should be yellow; eyes, red; face, bright red; ear-lobes, white; wattles, red; shanks and toes, yellow.

S. C. DARK BROWN LEGHORNS

"Color of Dark Brown Leghorn, male: Head, reddish-bay; neck, rich red, with distinct stripe extending down middle of each feather and tapering to point near the extremity of feather, the red to be free from black; back and saddle, rich red, striped with black; breast, black; body and fluff, black; wing bows, bright red; wing fronts, black; edge of lower web a rich brown, wide enough to secure a wing bay of same color; coverts, greenish-black forming a bar of this color across wing when folded; tail, black; sickles, greenish-black; under-cover, black or dark slate.

Color of Dark Brown Leghorn Female: Head, reddish-bay; neck, reddish-bay, with a distinct black stripe through the middle of each feather and tapering to a point near its lower extremity; wings, bows and coverts black stippled with dark brown; primaries, slaty black, the outer web edged with brown; secondaries, slaty black, the outer web stippled with dark brown; back, black stippled with dark brown and the presence of a greenish sheen is considered very desirable by some breeders; breast, should be heavily stippled with brown; tail, black; body and fluff, slaty black tinged with brown; shanks and toes may be yellow or dusky yellow and the under-color of all sections should be slate.



R. C. BROWN LEGHORNS

This standard for the dark female is supposed to eliminate the necessity of double mating to produce the ideal male, but there are numerous breeders of Brown Leghorns who are mating the dark males to dark females with penciled or partridge breasts instead of the stippled breasts

and are producing high class males from such mating. When the change was made to the Dark and Light varieties it was necessary to describe also the male that had been used to produce the ideal colored female and the Brown Leghorn Club agreed to the following description for the Light Brown Leghorn male. Head plumage, orange; Beak, Eyes, Comb, Face, Wattles and Ear-Lobes, same as Dark male. Neck should be orange at head and should gradually fade to a very light orange as it approaches the shoulders. The stripe in the neck feathers should be dull in color in contrast with the sharply defined stripe in the dark male. The wing bows should be light red, the primaries and secondaries black, edged on lower webs with light brown. Back, reddish-brown, saddle feathers, light orange or lemon color and the Standard says these feathers should show some stippling. Tail should be black, as should the sickles and coverts. Body and Fluff should be slate slightly tinged or powdered with brown. Shanks and toes, yellow; under-color of all sections, slate.

The Light Brown Leghorn female's description has always been in the Standard of Perfection. There is still a diversity of opinion as to whether the dividing of this breed into two varieties has been of a benefit that will be lasting, as many breeders use their own methods of mating to try and produce the ideal, but in the show room they must be shown to conform as nearly as possible to the requirements as printed in the American Standard of Perfection, by which all exhibits are judged.

The disqualifications for Single Comb Brown Leghorns are the same as in the case of the White variety except as to color of plumage. White secondary feathers in the wing, white main tail or sickle feathers also disqualifiy a Brown Leghorn.

Mr. W. H. Card, of Manchester, Conn., is one of the very best authorities in this country on the breeding of poultry and what he says below refers to Brown Leghorns, penciled, double laced and stippled breeds. His book on the Laws of Breeding (price $1.00) covers many varieties, and also gives a successful method of line breeding.

"In the penciled and stippled varieties of fancy fowls there is a decided similarity in the laws which govern them. The similarity leads the investigator to the belief in one original source. They are therefore related, as their many similar characteristics prove, yet with sub-laws controlling the difference between penciling and stippling. The main law which proves their relationship is the fact that the males of all penciled and stippled breeds or varieties must have black breasts and bodies. This is an imperative law as regards these breeds and cannot be transgressed if one expects favorable results. To illustrate: a certain well known fancier and friend conceived the idea of a penciled Brown Leghorn, with the male penciled in every section like the female. The results of six years of effort show the impossibility, as every male comes with black breast and body. I am absolutely positive that he can breed till the crack of doom and not produce a penciled breed with males having penciled breasts and bodies. He is working contrary to the laws governing penciled or stippled breeds. Yet in seeming disregard to all this are the two exceptions, Dark Cornish and Red Caps. Both breeds show males having solid black breasts and bodies, and females of Red Caps not penciled or stippled but with an abortive or crescent shaped spangle. Females of the Dark Cornish have both lacings and pencilings. A lacing goes around the edge of the feather; penciling is on the feather away from the edge. A Dark Cornish female has a lacing and also a penciling, the only known breed so marked. The rule is that black breasted males do not belong to any species of fowls or birds carrying lacings or spangles and only belong to those species carrying pencilings or stipplings. All penciled breeds are alike in distinctive markings. All stippled breeds are alike in distinctive markigs. While the male of penciled varieties is similar to the male of stippled varieties in having black breast and body, the similarity ends there, except where double mating is used. This only proves their relationship as well as the sub-laws which govern each kind and breed. In every breed or variety where female is penciled the male carries a black stripe in hackle and saddle. In every breed or variety where the female

is stippled the male does not carry a black stripe in hackle and saddle, except in Brown and Silver Leghorns.

"These two varieties call for black stripe in hackle and saddle, which cannot be produced without double mating. Double mating, in this instance, seems to break the sub-laws governing penciling and yet it proves those laws, as it is a well-known fact that females of the male line of these two breeds are more inclined to penciling than to stippling; that males of the female line are without the black stripe in hackle and saddle making them very deficient therein.

"Another peculiar fact in connection with these sub-laws which, while not exactly pertinent to the subject, is well worthy of notice, is the phenomenon of color harmony or color aura. Every male of every variety carrying red plumage with black stripe in hackle and saddle should have yellow legs to perfect the color harmony or aura; which accounts for the exceeding beauty of the Standard-bred Brown Leghorn male. Take the same bird and remove the black stripes and a dirty, rusty, red plumage is the result. Take the same bird again and put willow, green, white or blue on him, as he is without black stripes in hackle and saddle, again the color aura is perfect and a beautiful bird appears. Put in the black stripes with the willow legs, etc., and a coarse color greets the eye. Seemingly in support of the above, most stippled breeds have willow legs, etc., most penciled breeds have yellow legs.

"In stippled breeds it is a law that the female shall have salmon breasts, yet some breeds of silver varieties that are stippled claim they should have silver breasts, as they claim it enhances the entire silvery gray plumage. Yet silver breasts are related to pencilings, not stipplings, and the absence of salmon will cause pencilings on breasts and also tends to produce pencilings or coarse stipplings on back and wings. This shows conclusively a transgression of law. Furthermore, such females will have a tendency to produce black stripes in males. In stippled breeds, males inclined to have a dark stripe in the hackle, with the shaft of the feather light colored, will produce females full of that objectionable shafting on back and wings, as well as coarse stippling. This light shaft in the hackle of males of penciled breeds, and even in laced breeds, is the source of so much light shafting on the back and wings of these breeds. It is a very bad defect in any breed and it is found in nearly every breed, even in white and black birds. It should be avoided in every case in the breeding yard. Note that its source is in the hackle of the male and can be avoided if proper care is taken in selecting breeding males free from defect.

"Shafting, brickiness and pencilings are closely related, because all males of penciled breeds have a black stripe in the hackle from which the shafting springs. Brickiness is allied to the red plumage of many penciled breeds and again proves broken laws when these defects are found in stippled breeds; therefore, the deductions are that a breeding male of a stippled variety must have no light shaft to hackle and must have a solid black breast; that the females must be free from inclinations to pencilings, shafting or brick and have clean salmon breasts. The above also applies to males of penciled varieties, especially as regards black breast, as splashed breasts on breeding males mean an inclination to lacings on female young from such a sire; another indication of a broken law of infusion of blood foreign to kind.

"In penciled females avoid using those with irregular pencilings or those with bars across the feathers. This shows poor selection as well as haphazard work in breeding. Such females are inclined to produce males with smutty hackles, shoulders and saddles. In choosing breeding females of either penciled or stippled varieties, see that the small feathers covering the entire under side of the wings and the small feathers inside of the tail are accurately penciled or finely stippled, according to breed. Some breeders choose their males by the same method but choose them when only eight weeks old, because then their chick feathers show pencilings or stipplings on entire surface and also their relative breeding value. Chicks from penciled, stippled or double laced breeds are hatched with the so-called chipmunk markings or regular stripes of dark and

light color and substantiate the claim of one original source for these breeds."

ROSE COMB BROWN LEGHORNS

The Rose Comb Brown Leghorns are exactly the same as the Single Comb except as to the shape of the comb.

BLACK LEGHORNS

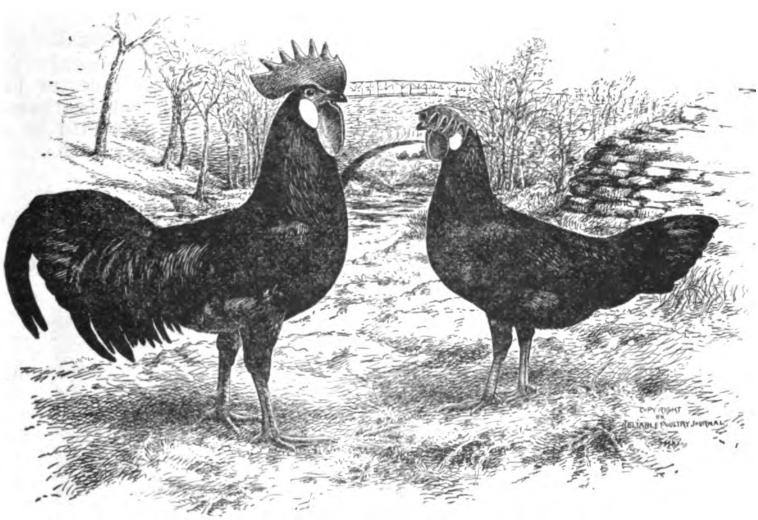
Black Leghorns are becoming popular again and are a very worthy variety, having all the good qualities of the other varieties of Leghorns.

S. C. BLACK MINORCAS

The Minorca also belongs to the Mediterranean class, having been developed in the countries around the Mediterranean sea.

There are five varieties, the Single and Rose Comb Black, Single and Rose Comb White, and the Single Comb Buff.

The Minorca is the largest breed in the Mediterranean class. The American Standard of Perfection weight for the cock is 9 pounds; cockerel, 7½; hen, 7½; and pullet, 6½ pounds. The S. C. White, R. C. Black, R. C. White and S. C. Buff weigh one pound less each than the S. C. Black. They usually have large combs and long bodies. They lay large white eggs in sufficient numbers to be classed with the egg breeds.



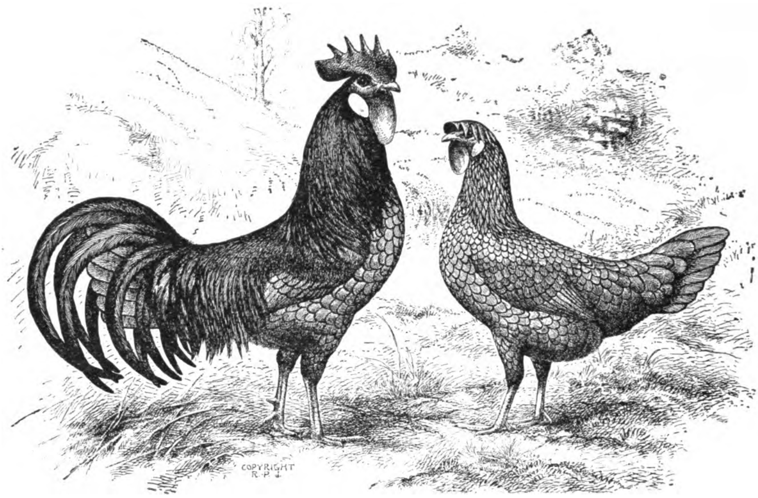
S. C. BLACK MINORCAS

The Single Comb Black Minorca is perhaps the best known. They were at one time called the Red Face Black Spanish. They lay the largest eggs of any variety of chickens. Their eggs are white in color and are in great demand. They do not lay as well as Leghorns. However, some hens of this variety lay over 200 eggs per year.

If a specimen of this variety had white or red in its plumage; white in the face of cockerel or pullet; or shanks that were not dark slate or black in color it would be disqualified.

BLUE ANDALUSIANS

There is only one variety of this breed, and this belongs to the Mediterranean class. They are blue with dark lacing around the edges of each feather. This variety is a direct descendant of the Black Spanish. Many of the offspring come with plumage either too light in color or almost black. A real Blue Andalusian is a very pleasing color. They have five point combs. Their weight is 6 pounds for the cock; 5 pounds for the cockerel; 5 pounds for the hen; and 4 pounds for the pullet. Cockerels



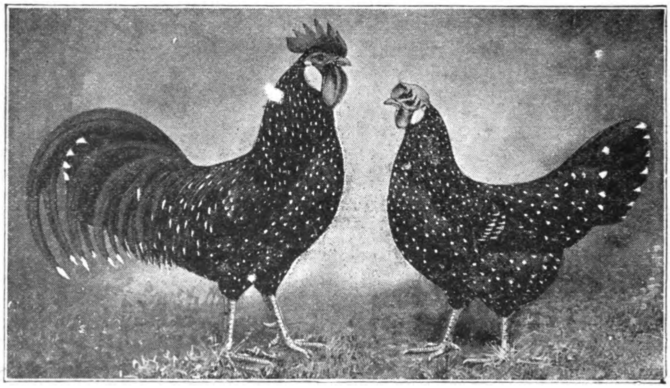
BLUE ANDALUSIANS

and pullets of this variety that have positive white in the face, or birds having shanks not blue or slatish in color; white or red feathers in plumage. or one-third of the surface of the ear-lobes red, would be disqualified. They are not as good layers as the average Leghorn.

MOTTLED ANCONAS

The Ancona, like the Leghorn and Minorca, belongs to the Mediterranean class, and for the same reason.

There are two varieties of Anconas, the Single and the Rose Comb, both being alike except their combs.



S. C. ANCONAS

The Ancona is about the same size as the Leghorn, has a large comb, smooth shanks and lays large numbers of large white eggs, so for this reason they are classed as an egg breed.

The American Standard of Perfection weight for the cock is 5½ pounds; cockerel, 4½ pounds; hen, 4½ pounds; and pullet, 3½ pounds. They have become quite popular in the last few years. They were first brought to this country from Italy in about 1890.

If one did not care to use Leghorns on a commercial egg farm, we believe that the Ancona would be our next preference. Their eggs are

quite large for the size of the bird. Their plumage is black mottled with white. About one feather out of every five should be tipped with white, this proportion making a bird that will show rather dark in color.

White in the face of a cockerel or pullet would disqualify the bird. If one-half the ear-lobe is red; or red feathers in the plumage; or shanks not yellow or yellow mottled with black, would disqualify the specimen.

This is a good variety and will give entirely satisfactory results if the birds are properly bred.

QUESTIONS ON LESSON NO. 6

1. What is the origin of our domestic fowls?
2. Explain class, breed, variety and strain.
3. Which is the larger, and how much, the Light or Dark Brahma?
4. Compare the shape of the Cochin and Langshan.
5. Tell of the origin of the Leghorn.
6. For what is the Minorca noted?
7. Describe the Ancona.
8. Name the varieties of Plymouth Rocks.
9. Explain the color of the Silver Wyandottes.
10. Where did the Rhode Island Reds originate?

ENGLISH CLASS NO. 4

BREEDS	VARIETIES
Dorkings	White Silver Gray Colored
Red Caps	Red Caps
Orpingtons	Single Comb Buff Single Comb Black Single Comb White Single Comb Blue
Cornish	Dark White White-Laced Red
Sussex	Speckled Red

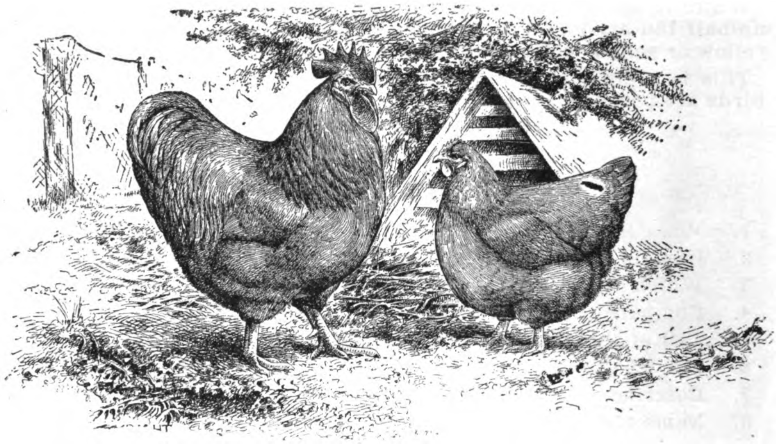
There are five breeds and thirteen varieties in the English class.

S. C. BUFF ORPINGTONS

The Orpington belongs to the English class with the Dorking, Cornish, Red Cap and Sussex. All the different varieties of Orpingtons have solid colors, there being the Black, White, Buff and Blue.

The Orpington is very popular as an all-purpose breed, as they produce good meat and are also good egg producers. It has a single comb and a white skin. The American Standard of Perfection weight for the cock is 10 pounds; cockerel, 8½ pounds; hen, 8 pounds; and pullet, 7

pounds. The Buff variety is one of the most popular and is the one shown in the illustration.



S. C. BUFF ORPINGTONS

The Orpingtons were originated with a set purpose of producing a bird that had good meat qualities combined with egg qualities, and they have proven to be a good all-purpose fowl. They have a mild disposition and are easily confined.

The Buff Orpington was created by mating Colored Dorking pullets to Golden Spangled Hamburg males. Pullets of this mating were bred to Buff Cochin males.

There is a difference of opinion as to the origin of the Orpington. One of our Canadian students, who has made a study of Orpingtons, recently wrote us as follows:

"When Mr. William Cook of Kent, England, the originator of all the Orpingtons, was on a tour through England years ago lecturing, he saw some birds that were called Lincolnshire Buffs. He made inquiries and came across some that had been crossed again with Indian Game. They took his fancy, so he bought some from three men and they were the foundation of his stock for what are now called Buff Orpingtons. These Lincolnshire Buffs have clean legs, but have been bred from Buff Cochins. I have heard Prof. Herner of Manitoba College lecture that the reason some had feathers on the shanks was the result of the Cochin blood in the make-up."

They have a large body on short legs and present a blocky appearance. This variety lays well in fall and winter. They are persistent sitters in Spring and Summer and do not lay so well during these seasons. They fatten well and make a beautiful carcass when dressed, and are a good all-purpose variety.

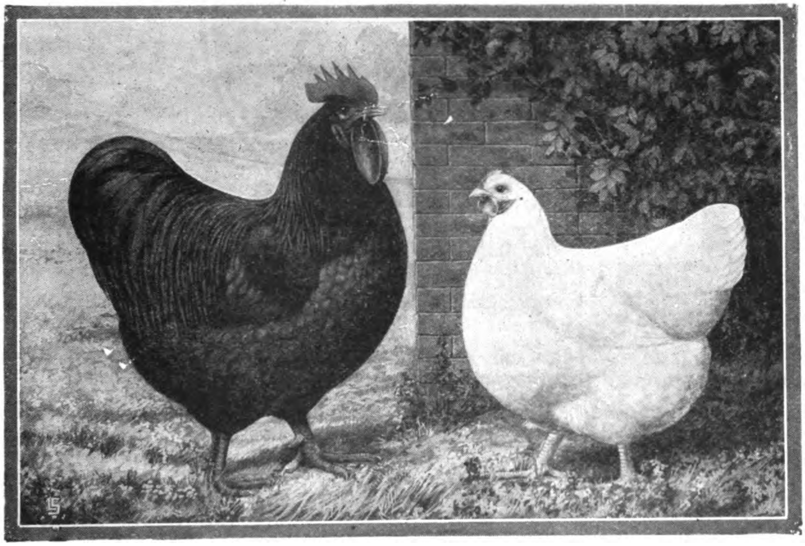
The shanks must be pinkish or white in color and if not the specimen would be disqualified. Yellow skin, shanks or beaks, or any considerable amount of white in the ear-lobes would disqualify.

WHITE AND BLACK ORPINGTONS

The White Orpington is one of the best of the Orpington family. They are beautiful in appearance and combine some of the best utility qualities. If properly bred, they are good winter layers. As a market fowl they dress up nicer and command a better price than any other variety, because of their plump carcass and white skin, which produces a white fat. They are not as good layers as some varieties and the male

birds have a tendency to brassiness in the plumage, but not so much so as in former years. They were created by mating a White Leghorn cock to Black Hamburg females. The pullets thus secured were mated to a White Dorking male.

If a specimen had any color in the plumage other than white, or had a large amount of white on the ear-lobe it would be disqualified. The shanks are required to be pinkish or white in color. Yellow skin or beak would disqualify.



BLACK AND WHITE ORPINGTONS

The Black Orpington is a great fall and winter egg producer. We have had pens of this variety make more net profit than any other variety in our egg contests, because they laid their eggs in winter when eggs were high. Some object to their black plumage. Purple barring or purple in the plumage is a serious defect.

This variety was originated by crossing black sports bred from Barred Rocks with Black Minorcas, and these pullets mated to a Black Langshan male.

White in plumage, yellow skin, beak or legs, or a large amount of white on the ear-lobes would disqualify a Black Orpington.

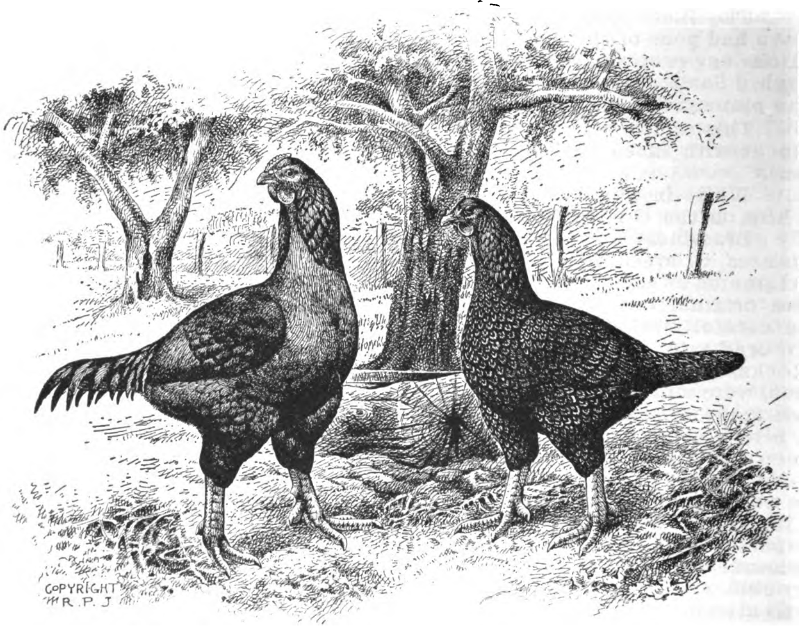
Brassiness or creaminess in white fowls can be traced, in most instances, to breeding stock of short pedigree. Many white varieties were originated as sports from dark blood, or have dark blood in their veins from the original cross from which they did originate. Such birds have to be carefully selected and bred for a sufficient number of years in order to eradicate this tendency to brassiness. Years ago White Plymouth Rocks, White Leghorns and White Wyandottes, in fact, all white varieties, were much more brassy than they are at the present time. Today there are many strains of these varieties that are pure white and stay white. White Orpingtons, White Langshans and White Minorcas have not been sufficiently line-bred for a period long enough to eradicate these defects entirely. Yet there are strains of these varieties that come as white as any other varieties, all of which is due to careful selection and breeding. All breeders of white varieties of chickens must free their minds of the superstitious belief that yellow corn and such things are responsible for brassiness in white birds. The feed has nothing whatever to do with this trouble, except that corn or any kind of feed which produces over-fatness will always produce such a large quantity of oil that the feathers may have a creamish cast. There is no way to eliminate creaminess and brassiness

in the plumage except by careful selection and breeding. You must breed for white plumage if you expect to get it.

CORNISH

The Cornish fowl originated in England. Its rough angular appearance gives it the appearance of a game fowl.

There are three varieties; the Dark, White and White Laced Red. The Dark was created in England and the other two in America.



DARK CORNISH

The close fitting, hard feathers make it very deceiving in its weight. The American Standard of Perfection weight for the cock is 10 pounds, the cockerel 8, the hen 7½, and the pullet 6, for the Dark and White; while the White Laced Red weigh 8, 7, 6 and 5 pounds, respectively.

The greatest popularity has come to the Cornish fowl because of the large quantity of breast meat and of flesh on the thighs.

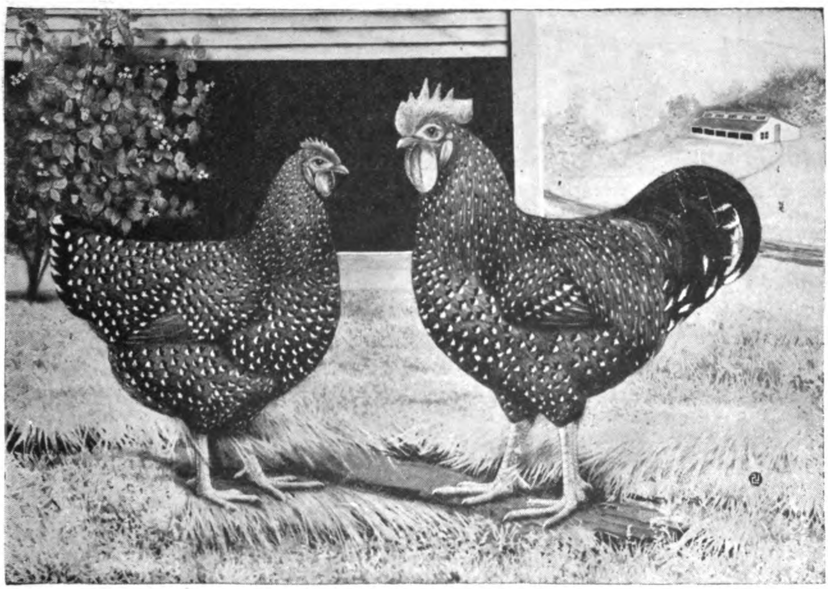
The color of the Dark Cornish is composed of black and red or bay while the color of the White Cornish is solid white, and the White Laced Red Cornish is a bright, rich red and the feathers laced with a narrow regular lacing of white.

The most prominent characteristic of the Cornish fowl is the resemblance to the Aseel fowl. The Dark Cornish is the most popular. Blue, black or white shanks would disqualify this variety; they should be yellow.

SPECKLED SUSSEX

The Sussex originated in England in the County of Sussex from which they get their name. They are somewhat similar to the Rhode Island Red in shape. The Speckled variety are splendid layers and beautiful birds. The body feathers are reddish brown in color, tipped with white, and a black bar separates the white from the reddish brown.

The required weights are, cock, 9 pounds; cockerel, 7½ pounds; hen, 7 pounds; and pullet, 6 pounds.



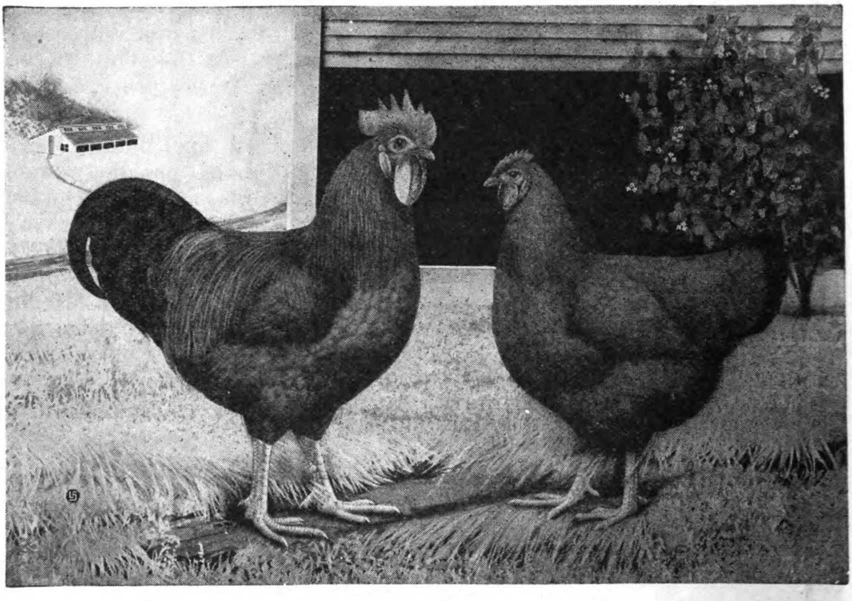
SPECKLED SUSSEX

This variety is required to have white skin and shanks or the specimen is disqualified. If there is much white on the ear-lobe the bird will also be disqualified.

This variety has many points to commend it and we believe it will grow in popularity.

RED SUSSEX

The Red Sussex resembles the Rhode Island Red except that it is not quite so horizontal in shape and is required to have white skin and shanks. The color, instead of being a rich, brilliant red, should be a mahogany red. The weight, shape, etc., is the same as that required for the Speckled



RED SUSSEX

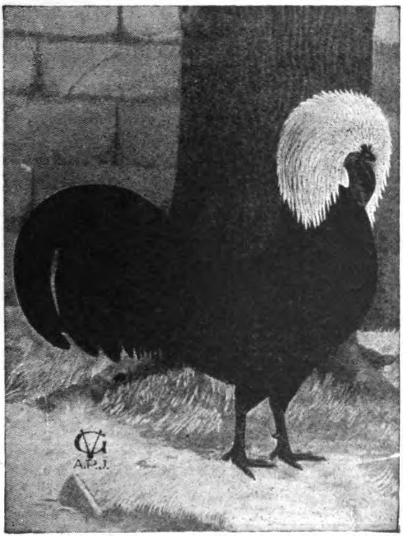
variety. We would prefer the Rhode Island Red if we expected to breed a red chicken. The disqualifying points are the same as with the previous variety, with the added fact that white feathers in the outer plumage will also disqualify.

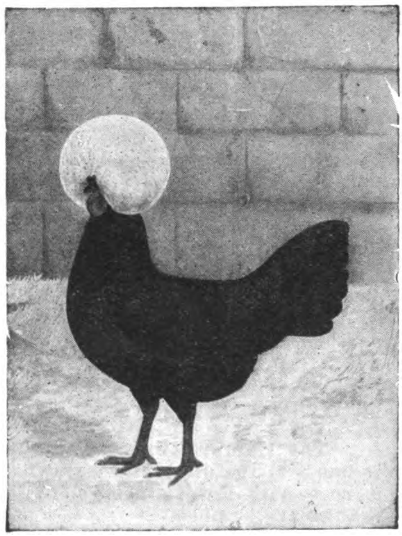
POLISH CLASS NO. 5

BREEDS	VARIETIES
Polish	White Crested Black Bearded Golden Bearded Silver Bearded White Buff-Laced Non-Bearded Golden Non-Bearded Silver Non-Bearded White

There is one breed and eight varieties in the Polish class.

WHITE CRESTED BLACK POLISH





This variety is supposed to have originated in Poland. It is one of the oldest varieties. The pure white crest on the head of a bird with solid black plumage makes a very attractive combination. This variety has a V-shaped comb. The plumage should be a greenish black. The eyes are a reddish bay and the legs and toes a bluish lead color. We would not recomemnd this variety except chiefly for fancy and ornamental purposes. Many of the females, however, are good layers. Some varieties of Polish, in addition to having a crest, are required to have a beard as well. The Standard gives no weight for this variety.

HAMBURG CLASS NO. 6

BREEDS	VARIETIES
Hamburgs	Golden Spangled Silver Spangled Golden Penciled Silver Penciled White Black

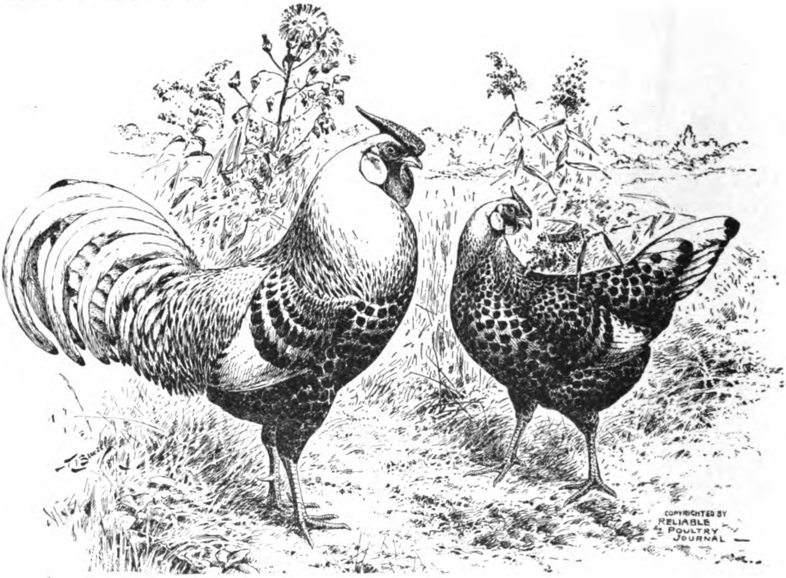
There is one breed and six varieties in the Hamburg class.

HAMBURG

The Hamburg class contains only one breed, the Hamburg, yet there are six varieties, the Golden Spangled and Penciled, the Silver Spangled and Penciled, the White and Black.

Their origin was in the town bearing the same name in Holland.

Although being classed by some as ornamentals, yet they are very good egg producers, laying pure white eggs, the only objection being the smallness of the eggs, but for hospitals and sanitariums they are considered the proper size.



SILVER SPANGLED HAMBURGS

The Hamburg is very small and of an active, nervous temperament. It has a shape distinctly its own, its body being long and round; its comb is rose with a very prominent spike. The ear-lobes are white and the shanks are smooth.

The Silver Spangled is the most popular variety. Its body color is white with black spangles at the end of each feather. The Golden Spangled Hamburg is marked similar to the Silver, except they are of a golden bay color.

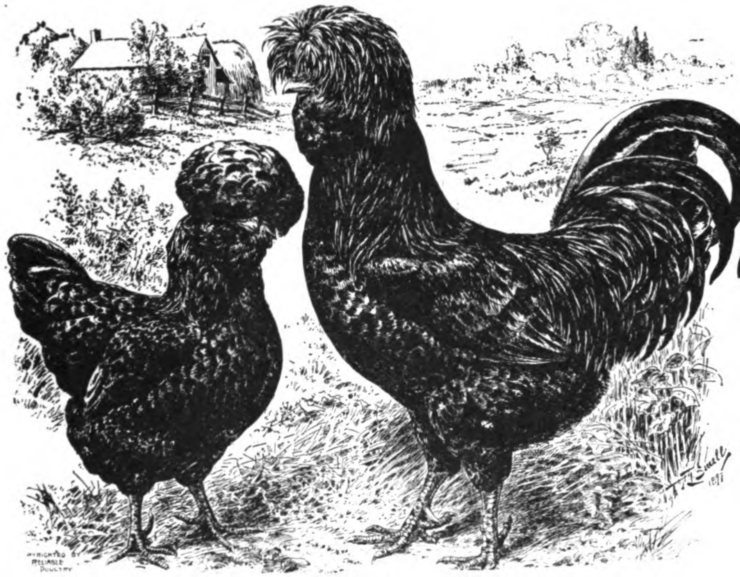
The coverts on the wing of the Silver Spangled Hamburg should be spangled so evenly and clearly that on looking at the specimen it would appear as if there were two distinct black bars, running parallel across the wing; the ear-lobes must be white; and the shanks a bluish lead color, or the bird will be disqualified. A male bird that is hen feathered will also be disqualified.

FRENCH CLASS NO. 7

BREEDS	VARIETIES
Houdans	Mottled White
Crevecoeurs	Black
La Fleche	Black
Faverolles	Salmon

There are four breeds and five varieties in the French class.

The French class originated in France and is composed of four breeds, the Houdan, the Crevecoeurs, the La Fleche, and the Faverolle.



MOTTLED HOUDANS

The Houdan has a number of characteristics different from the most common breeds of fowls, such as the V-shaped comb, crest, beard, and five toes. The Houdan is considered by some as belonging to the ornamental breeds, but they lay a good number of white eggs and are large enough to be of value as meat producers. There are two varieties, white and mottled.

The American Standard of Perfection weight for the cock is 7½ pounds, the cockerel and the hen 6½ pounds each, and the pullet 5½ pounds.

The Crevecoeur, like the Houdan, has a crest and beard, but unlike the Houdan, has only four toes on each foot instead of five.

The Crevecoeur is one-half pound heavier than the Houdan.

The La Fleche is one-half pound heavier than the Crevecoeur and one pound heavier than the Houdan. The La Fleche should not have a crest and beard as do the other two varieties just described.

The Faverolle is about the size of the Crevecoeur and almost square on the back. They have no crest, but have a beard and muffs.

A Houdan would be disqualified for the absence of beard or crest. Red feathers, or any color besides white or black, in the plumage would also disqualify.

CONTINENTAL CLASS NO. 8

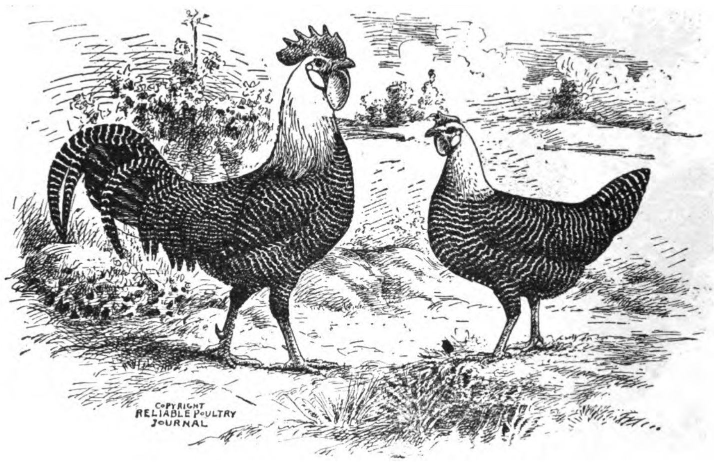
BREEDS	VARIETIES
Campines	Golden Silver

There is one breed and two varieties in the Continental class.

CAMPINES

In general appearance, the Campine resembles the Leghorn in shape, having a large comb and a small body and having the active, nervous temperament so characteristic of the Leghorn.

There are two varieties of Campines, the Silver and Golden. The color scheme is formed by bars running across the feathers. The Silvers have white bars on the black body of the feather, while the Golden has bay bars on black feathers.



SILVER CAMPINES

The Campine is slightly heavier than the Leghorn, according to the American Standard of Perfection, weighing 6, 5, 4 and 3½ pounds, respectively, for cock, cockerel, hen and pullet.

The present day Campines were originated by crossing the original Campines with the Braekel of Belgium. The present Campine is a very beautiful fowl. They are not very good layers, as a rule, and their eggs are rather small, but they are a very attractive fowl and have many things to commend them. We have found many specimens low in vitality.

The most serious defects which are considered are: White in the face of cockerels, more than one-half red in the ear-lobes, and legs other than a leadish color. All of these defects disqualify.

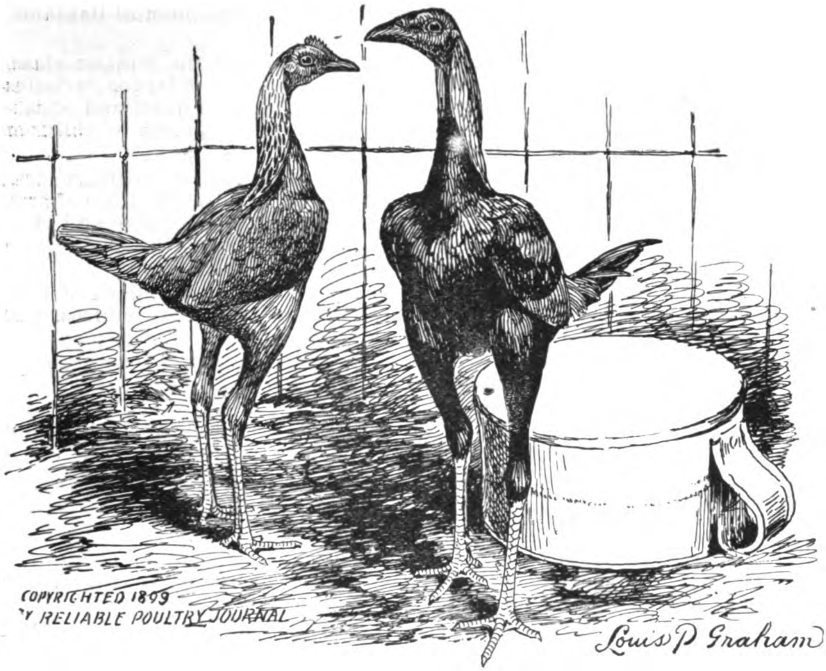
GAMES

The American Standard of Perfection admits eight varieties of Games and a corresponding number of Game Bantams. The Games were formerly grown by men who indulged in cock fighting, but since the general public admires a much higher class of competition in the form of poultry shows and egg laying contests, the Game has lost much of its former popularity.

The varieties are Black, White, Red Pyle, Birchen, Silver Duckwing, Golden Duckwing, Brown Red, Black Breasted Red.

They are known as Class No. 9.

The Bantams are grown principally for pets and are of very little economical importance.

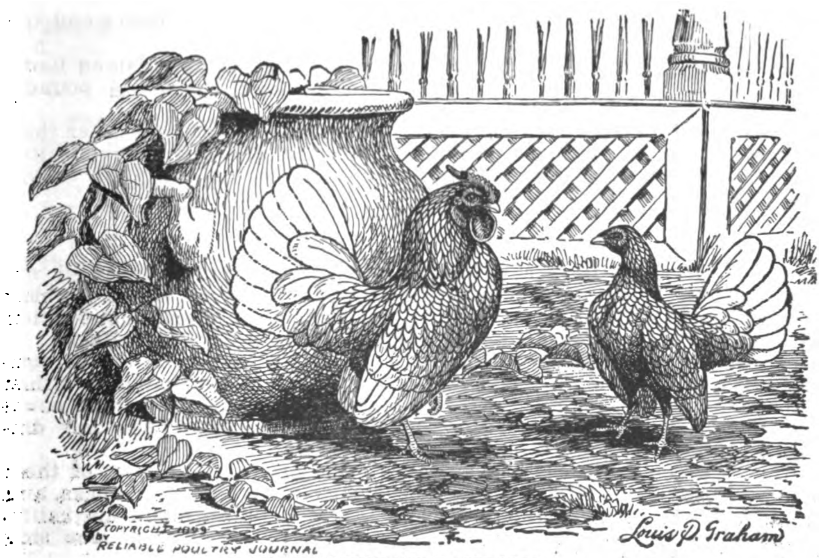


They have a peculiar carriage of their own and stand high up on their legs. They are a very close feathered fowl.

ORIENTAL CLASS NO. 10

This class consists of three breeds and three varieties, as follows: Black Sumatras, Black Breasted Malays and Black Breasted Red Malay Bantams.

ORNAMENTAL BANTAMS



SEBRIGHT BANTAMS

There are eight breeds and nineteen varieties of Ornamental Bantams. They constitute Class No. 11.

The Sebright Bantam is perhaps the best known of the Bantam class. The Bantams are used to a great extent to hatch eggs of larger varieties of fowls early in the season, also for hatching the eggs of quail and pheasants, and they are excellent mothers. They are usually grown by children and are very easily kept.

Some Bantams are good egg producers. The varieties of Ornamental Bantams are Silver and Golden Sebright; Black and White Rose Comb, White Booted, Dark and Light Brahma; Black, White, Partridge and Buff Cochin; Gray, White, Black, and Black Tailed Japanese; Bearded White Non-Bearded, and Buff Laced Polish; and Booted Mille Fleur.

The weights of Bantams are given in the American Standard of Perfection in ounces, most of them weighing between 20 and 30 ounces, and they are usually disqualified for over-weight.

MISCELLANEOUS CLASS NO. 12

This class consists of Silkies, Sultans and Frizzles. We would not recommend any of these for commercial purposes.

NON-STANDARD VARIETIES

Rhode Island Whites

This is not a new breed as many suppose. Authentic record of this variety having been traced back for nearly thirty years.

The origin of this breed as given by the Rhode Island White Club is as follows:

A Partridge Cochin and White Wyandotte cross was made for the foundation, and after that a Rose Comb White Leghorn Male was used, thus making this breed a combination of Cochin, Wyandotte and Leghorn blood.

It is only of recent years that this breed has been brought to the attention of the public, breeders claiming that they cannot be excelled as a laying fowl, that they mature quickly and are a good table fowl. In shape they should be exactly like the Rhode Island Red, and in color pure white. There are two varieties, one having a Single Comb and the other a Rose Comb.

Weights of Rhode Island Whites are the same as Rhode Island Reds, namely, Cocks, 8½ pounds; Cockrels, 7½ pounds; Hens, 6½ pounds, and Pullets 5 pounds.

Disqualifications which apply to this variety are "Feathers other than white in any part of plumage; ear lobes more than one-half postive white; feathers or down on shanks or toes, and shanks or toes any color except yellow."

Rose Comb Barred Plymouth Rocks

From the most authentic information we can find this variety originated from "Sports" of the S. C. Barred Plymouth Rocks. These "Sports," no doubt, came from the original blood of the Dominuque which was used as a foundation of the present S. C. Barred Plymouth Rocks.

However, the Rose Comb Barred Plymouth Rock should not be confused with the Dominuque today, as there should be no similarity either in shape or color. The Rose Comb Barred Rock should be the same type and color as the Single Comb variety of that breed, the only difference being in shape of comb as the name would infer.

There seems to be many who favor this variety on acocunt of their having a Rose Comb. Weights are the same as in all Plymouth Rocks, and the same disqualifications apply except in Comb. Rose Comb disqualifications will apply—absence of spike or comb falling over on one side so as to obstruct the sight.

Jersey Black Giants

This breed is comparatively an old breed, authentic records of their breeding for nearly fifty years past being in our possession. The original cross is said to be Black Langshans, Black Javas and Dark Brahmas, and from this foundation has been produced a truly wonderful fowl.

They originated in the state of New Jersey and for years were bred and raised under the most rigid climatic conditions. No especial care being given them in regard to housing, etc., these conditions tending to make a strong, vigorous breed. They breed true to type and color, and as the name Giants would indicate, they are of unusual size, in fact, the largest of all breeds of poultry.

The Standard weights that have been recommended by the Jersey Black Giant Club are as follows:

Cock, 13 pounds; Cockrel, 11 pounds; Hen, 10 pounds, and Pullet, 8 pounds.

Jersey Black Giants should have a single Comb, red face, ear lobes and wattles red, color of plumage all over should be black with a greenish sheen, but purple showing on plumage is a serious defect. Color of legs and toes should be black, but the bottoms of the feet must be yellow, they also dress with a yellow skin. They lay a rather large brown shelled egg, and are considered one of the best market fowls in existence, especially so for Capons and Roasters.

Disqualifications that apply to this breed are as follows: Bottoms of feet other than yellow, ½ inch of positive white in plumage, stubs or down on shanks or feet and the general disqualifications that apply in Comb.

Buttercups

Buttercups are not a Standard variety. They are rather a reddish brown in body color and their feathers are specked with black. They are somewhat larger than Leghorns or Anconas; have rather plump bodies and are fairly good layers.

They derive their name from their combs, which turn upward, and hollow in the center and shaped similar to a buttercup. This variety is not bred very extensively, but has many good characteristics. It may be that it will never become popular enough to be admitted to the Standard.

Rhinelanders

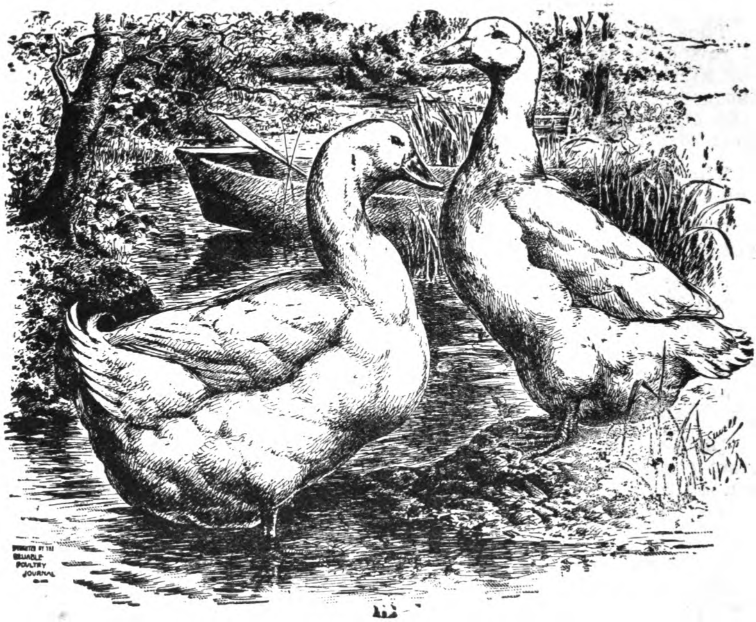
There are some two or three varieties of Rhinelanders but the most popular of these is the Black variety. These have the rose comb, white ear lobes, lay a white egg, and are about the size of Leghorns. This variety was imported to this country from Germany. These birds carry a rather heavy tail and are beautiful in color.

There is, also, a Barred and White variety of Rhinelanders, but none of these have been admitted to the Standard. The Blacks have made very good records in American egg laying contests.

DUCKS

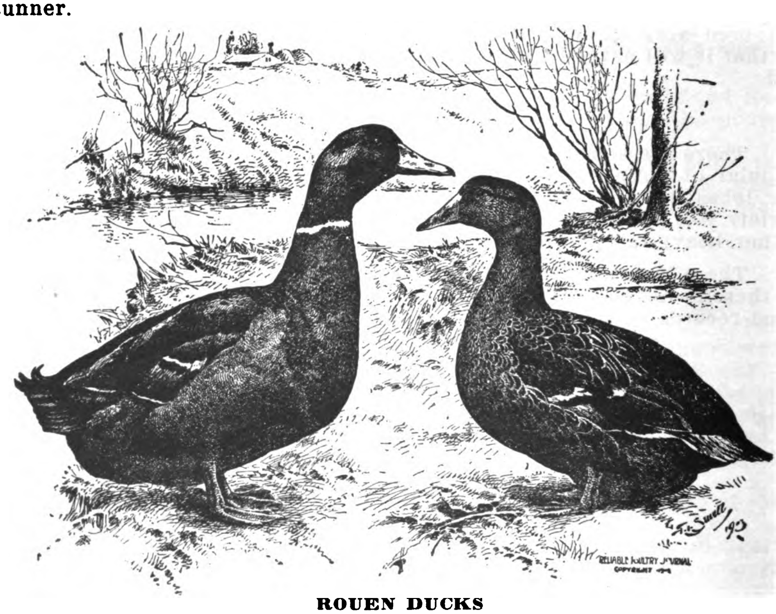
The Standard-bred ducks are water fowls which have been domesticated from their wild ancestors.

Ducks constitute Class No. 13. The varieties of Ducks are as follows: The colored Rouen, White Pekin, White Aylesbury, Black Cayuga,



PEKIN DUCKS

Gray and White Call, Black East India, Colored and White Muscovy, Blue Swedish, Buff, White Crested, Fawn and White, White and Penciled Runner.



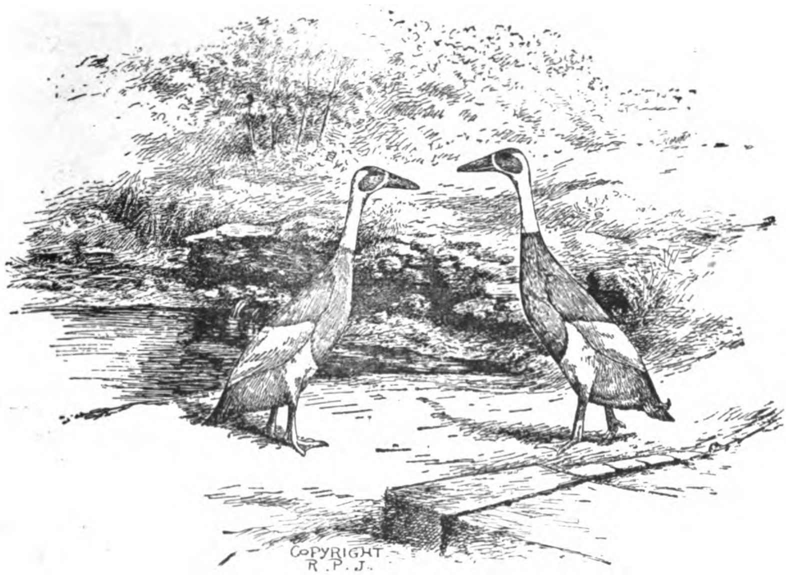
ROUEN DUCKS

There are eleven breeds and fifteen varieties of which the Muscovy is the largest, acording to the American Standard of Perfection, weighing 10 pounds for old drakes, young drakes 8 pounds, and old and young ducks 7 and 6 pounds, respectively.

The Pekin, Rouen and Aylesbury are perhaps the best known of the feather and meat producers. They require the same weights, according to the American Standard of Perfection, being 9, 8, 8 and 7 pounds, respectively, for old and young drakes and old and young ducks.

The Pekin Ducks are considered the best for commercial purposes. They are rapid growers, and are reasonably good layers.

The White Runner, Fawn and White Runner and the Penciled Runner are all very good varieties.



FAWN AND WHITE RUNNER DUCKS

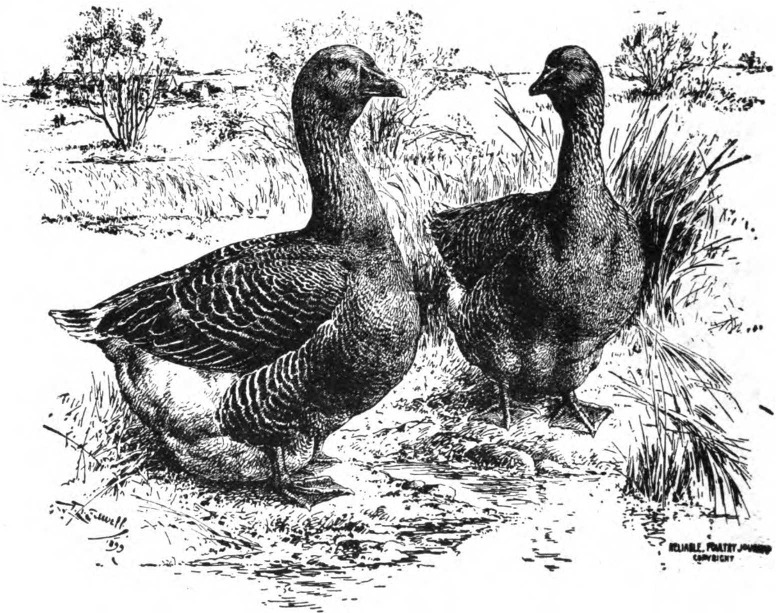
The Runner Ducks' weights, according to the American Standard of Perfection, are just half those of the Pekin, being 4½, 4, 4 and 3½ pounds, respectively. The Runner Duck is noted for its egg production, but does not produce so many feathers as the Pekin. These varieties are also fairly good for commercial purposes, but we really consider the Pekin best for market.

The East India and Call Ducks are considered the Bantams or Ornamentals of the Duck family.

GEESE

There are six breeds and seven varieties of Geese which have been domesticated from their wild ancestors. They constitute Class No. 14.

Geese are noted for their flesh and feathers, but do not produce a great number of eggs.



TOULOUSE GEESE

The Toulouse Geese are perhaps the best known. They weigh, according to the American Standard of Perfection, 26 pounds, 20 pounds, 20 pounds and 16 pounds, respectively, for old and young gander, old goose and young goose.

The varieties of geese are Gray Toulouse, White Embden, Gray African, Brown and White Chinese, Gray Canadian and Colored Egyptian.

TURKEYS

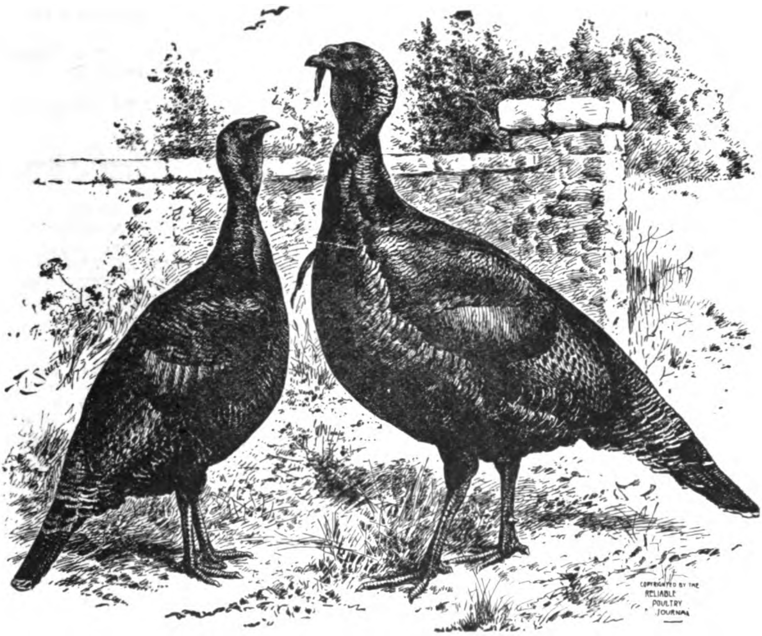
There are six varieties of turkeys which originated by the domestication of the wild ancestors. They are all included in Class No. 15.

The Bronze is the largest and best known of the six varieties. Its weights, according to the American Standard of Perfection, are 36, 33, 25, 20 and 16 pounds, respectively, for adult and yearling cock, cockerel, hen and pullet. The principal value of the turkey is its flesh. However, it is a good insect destroyer as it gets most of its living by wandering through fields and meadows catching insects which do much injury.

The other varieties are Narragansett, White Holland, Black, Slate and Bourbon Red.

The White Holland variety is considered the most quiet as they do not range so far as the other varieties.

Turkeys are noted for their fine meat, but are not large egg producers.



MAMMOTH BRONZE TURKEYS

QUESTIONS ON LESSON NO. 7

1. Name the breeds in the French class.
2. Compare the S. S. Hamburg and Houdan.
3. What characteristics are noticeable in the Polish?
4. Describe the Orpington.
5. Describe the Cornish fowl.
6. Why are the Games losing popularity?
7. Name the varieties of Ornamental Bantams.
8. Name the varieties of ducks and geese.
9. Name the feather and meat ducks, the egg producing ducks and the ornamental ducks.
10. Name the varieties of turkeys.

INDEX

The Principles of Mating and Breeding

By T. E. QUISENBBERRY.

The business world is demanding efficiency in every line of work. The slacker is despised and unwelcome. The world demands the highest degree of production, and the poultry and egg business is no exception.

It is true that the American Standard of Perfection, which is the guide for all breeders of pure bred poultry in selecting and judging their fowls, has many defects, yet a great variety of beautiful, thoroughbred fowls have been created and improved by the use of this Standard. The Standard bred fowl is the foundation upon which the whole poultry industry rests. What would the dairy business be without the great breeds of Holsteins, Jerseys, Guernseys and other breeds, and their Standards for the different breeds? What would the beef cattle industry be without the great Herefords, Shorthorns and other breeds, and the breeders' associations, each of which has its Standard of Perfection?

As far as meat is concerned, the Standard for poultry speaks in many places of "rather long and broad back," "rather deep and full breast," "long keel bone and large thighs," "long, deep, full body, which extends well forward," "luster to plumage," and other requirements for different varieties, none of which can be obtained only through careful selection and breeding, and through birds of the very highest vitality. Certainly in the face of such Standard descriptions, no one can dispute the fact that there are utility qualities in Standard bred poultry. Three thousand poultry buyers and fattening stations, in Missouri and other states, have all testified in writing to the fact that the pure-bred bird is superior to any other for market purposes. The meat on a chicken is bred on, and is not altogether a question of feeding.

The thing in which we are lacking most in our Standard fowl is egg production. This is not due to any fault of the Standard fowl, but is due to the lax methods of the breeders themselves. On one side, we have the utility man, who is too much inclined to disregard feathers on the legs, color of the plumage, and disqualifications of various sorts, just so long as his hens lay a large number of eggs. On the other hand, we have the extreme fancier, who does not care whether his hen lays an egg or not, or what size, color and shape the egg is, so long as the bird is able to win a prize in some show room. Both of these classes are in the wrong. We should not allow the pendulum to swing too far in either direction. Beauty and egg production can be and should be combined in the same fowl to the largest possible degree. There is a common ground upon which all poultrymen must meet if our industry is to prosper and the poultry business is to command the respect of the commercial and live stock world. It is of no use to say that this is an impossibility and that it cannot be done, for it is being done.

A few years ago, many authorities said that the two-hundred-egg hen was an impossibility, and they questioned the honesty of any man who made a claim to such a record, but today we have many hens that are laying three hundred eggs, and we know of flocks that average two hundred. Six thousand hens, from one farm in the state of Washington, recently averaged over one hundred and ninety-four eggs in one year and their net profit during the month of February of the same year was $6,500.00. A flock of hens at the Oregon Experiment Station averaged two hundred eggs for a period of twelve months, and a state institution in that same state had a flock that averaged more than two hundred eggs per hen for the year. A pen of hens in a recent Australian egg laying contest averaged more than three hundred eggs per hen for the year. Speaking of Australian birds, not very long ago a breeder from that country sent me a pen of White Leghorns that had been bred from a pen of winners in a previous

contest. These birds were not only great layers, but they had the shape and color of our American Standard bred Leghorns. This man claimed that he had imported their ancestors from one of our best American breeders, and that he had improved their egg laying qualities without injury to their Standard shape and color. The birds which he sent me proved his assertion to be true.

Somebody is going to breed a productive fowl. Then why not let the American breeder of Standard bred poultry breed, advertise and get the credit and the full benefit of same. It is simply a question of selecting and breeding. Egg qualities are bred and not fed into the hen, as is most generally supposed.

The highest laying hen which I have ever trap-nested or which we have ever had in our egg-laying contests was the above Single Comb White Leghorn, which produced 304 eggs from November 1 to October 31, a period of one year. You can see that the hen has a long, broad, stoutly-built body, large comb and wattles, a large crop for holding and consuming lots of food and is very broad between the legs. This hen was a wonderful producer and several months during the year laid each day consecutively. She came from a family of high producers.

The hen, in a sense, is nothing more or less than a manufacturing plant. We feed her all she is able to consume, she takes what is needed for her own bodily maintenance and she either converts the surplus into eggs or stores it up in her body in the shape of fat and flesh. If she is properly bred, she will convert this surplus into a profitable number of eggs above the cost of her keep. Some hens have a greater capacity than others for the consumption of raw material—food, and a greater ability for manufacturing the finished product—eggs. Some flour mills have the capacity and ability to produce 100 barrels of flour per day and other mills which look just like them have the capacity to manufacture 1,000 barrels per day. The difference is due to the machinery on the inside and to the management. The same principle applies in the case of the hen and in feeding her for egg production. If she hasn't the digestive organs to consume and digest larger quantities of feed, if she hasn't efficiency and vitality coursing through her veins, she is not going to prove to be a profitable fowl. If the average hen at present lays 100 eggs per year, and we can increase the average to 150 eggs by a little more careful selection and breeding, we would thereby make an increase of 50 per cent, and at no increase in the way of investment, labor, feed, equipment, or otherwise. This extra 50 per cent is largely profit, and is just the difference between success and failure. If breeders from other countries, like Australia, can import our Standard fowls and in a few years so mate and breed them as to double the yield, you can do the same if you are determined to do so.

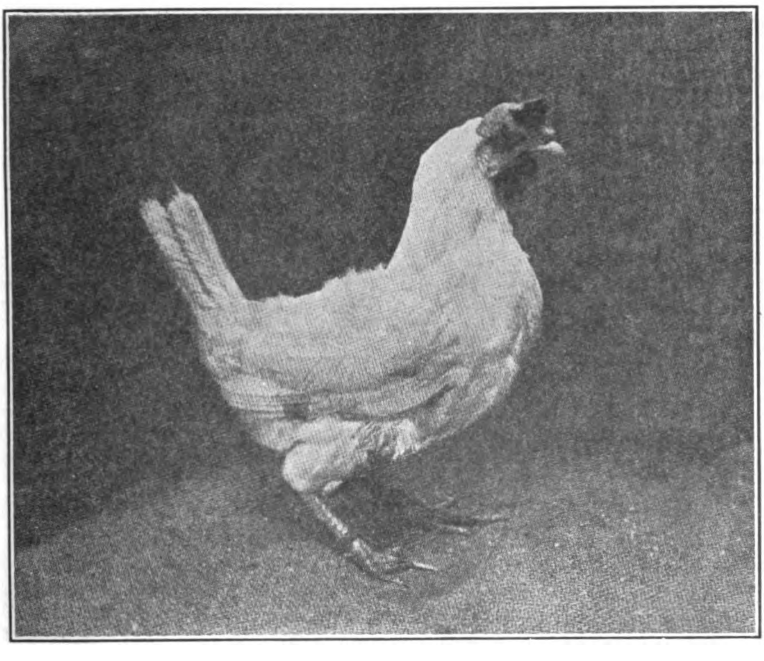
If our present Standard of Perfection does not measure up to the requirements, it is our duty to remedy the defect. If anything is contrary to nature's laws and will not permit the beautiful and useful to be blended into

one harmonious type and brought to the highest possible degree of excellence, it is our duty to correct it. In the champion dairy cow, we look for a big barrel, large milk veins, a big udder, and thin about the pelvic bones, instead of being fat and heavy like the beef type. Things which correspond to these must be looked for in the productive hen. Today we have utility and exhibition qualities combined in our Standard of Perfection to a far greater degree than any other poultry association or organization in the world. Yet there is room for improvement, and it is your duty and mine to work with that end in view. We should not be content with what has been accomplished. The great thing in which we are lacking, as I see it, is in getting our breeders of high-class Standard fowls to pay sufficient attention and in being as careful as they should be in selecting their birds to see that these two qualities, usefulness and beauty, are combined to a still greater degree.

If I could but do something toward turning the machine guns of rapid fire egg production on the drones in the flocks of this country; if I could but turn the cannon of better methods of care and production upon the farms and in the poultry yards of America; if I could but turn the battleships of high grade Standard bred fowls upon the poorly bred and poorly kept scrub flocks of this land; if I could but help eliminate the submarines of loss and waste in the handling and marketing of the poultry and eggs of this nation; if I could but contribute some little toward causing poultry profits to rise as airplanes to do battle with a common enemy, LOSS, I would feel well repaid for my life work in the interest of the poultrymen and the poultry industry of our United States. The suggestions made herein are offered with that end in view.

NATURE'S LAWS

To understand Nature's laws of reproduction, and in the following of them to bring into the world new creations of beauty and symmetry of



LADY LAY MORE

Laid 286 eggs in the Missouri National Egg Laying Contest. On account of putting all her energies into large numbers of eggs and because of lack of prepotency, this hen laid but very few fertile eggs.

creatures approaching perfection in utility qualities, is one of man's greatest accomplishments.

For centuries, Nature's laws, especially those which have to do with the perpetuation and reproduction of animal life, were considered inscrutable, too deep for mortal mind to grasp. But, as the plane of human intelligence slowly rose, and the range of scientific investigation gradually broadened, certain recurring phenomena in connection with animal reproduction and development were noticed. The study of these phenomena led to the discovery of certain basic principles or laws underlying, and to a certain extent governing, the reproduction and development of all. animal life, from the lowest cellular forms to the highly developed twenteith century man who considers himself "monarch of all he surveys."

In taking up the study of the laws of animal breeding, as applied to poultry, the student should strive to come to a full appreciation of the important part which these laws are destined to play in his or her breeding operations, and of the vital necessity of as thorough an understanding of their action as possible. Just as the engineer must understand the action of steam before he can manufacture an engine, and an electrcian, the peculiarities of electricity before he can make a dynamo, so the person who aspires to produce superior market poultry, or a strain of hens that will lay two hundred eggs each per year, or a bird that will score ninety-six points according to the American Standard of Perfection, must have a thorough understanding of the principles of animal breeding and of the methods of applying them.

Volumes have been written on the Laws of Animal Breeding, and a large volume might be written on the application of these laws to the problems of poultry breeding. Such a volume, however, to the beginner, might prove confusing, and more detrimental than beneficial. In the discussion which follows, scientific terms and technical language have been avoided as much as possible in order that the student may get as clear an understanding as possible of the principles themselves, and their application to the problems which are continually being met with in actual breeding operations.

If this lesson shall prove beneficial in enabling the reader to live up to the motto, "We Help A. P. S. Graduates to Succeed," the author will feel well repaid for the time and labor spent in preparing it.

BREEDING PROBLEM A DIFFICULT ONE

The successful breeding of poultry is one of the most difficult problems found in any branch of agriculture. Its greatest depths have never yet been fathomed, and, for that reason, it is a difficult subject to teach or to understand.

BREEDING ALL-IMPORTANT

We do not believe there is any branch of the poultry business that is so important to the poultry raiser as the question of selection and breeding. Live stock breeders of all kinds have come to realize that this is true, no matter what branch of the live stock business they may be engaged in.

A horse that is bred to trot no faster than a mile in four minutes could not exceed that record no matter how much training he might receive. On the other hand, another horse with the same driver, same sulky and same food, might travel a mile in two minutes, because he is bred for that purpose and has the blood lines which enables him to make such a record.

One cow may look just like another cow as far as size and color are concerned, but one may be bred in such a way that no matter how much feed, how perfect the care and conditions surrounding her may be, she will not exceed a given quantity of milk, perhaps not enough to even make her profitable. While the other cow that has years of selection and breeding back of her, with a line of ancestors all from high producing cows, would perhaps double, treble or quadruple the production of the first mentioned cow in milk and butter fat. Both are cows, but one is a profit-producer, because of selection and breeding, and the other is a money loser because of the want of proper selection and breeding.

The same is true with hens. Simply because a hen is a Leghorn, a Plymouth Rock, a Wyandotte, or a Red; simply because she is given good

feed and care, does not mean she is going to be a prize winner or a profitable layer. Unless a hen has at least two or three generations of careful breeding and selection back of her, the chances are she will be unprofitable and unsatisfactory. Without good foundation stock and without intelligent selection and breeding on the part of the poultryman, his efforts along poultry lines are apt to result in failure—we care not whether he is breeding for egg production or for the show room.

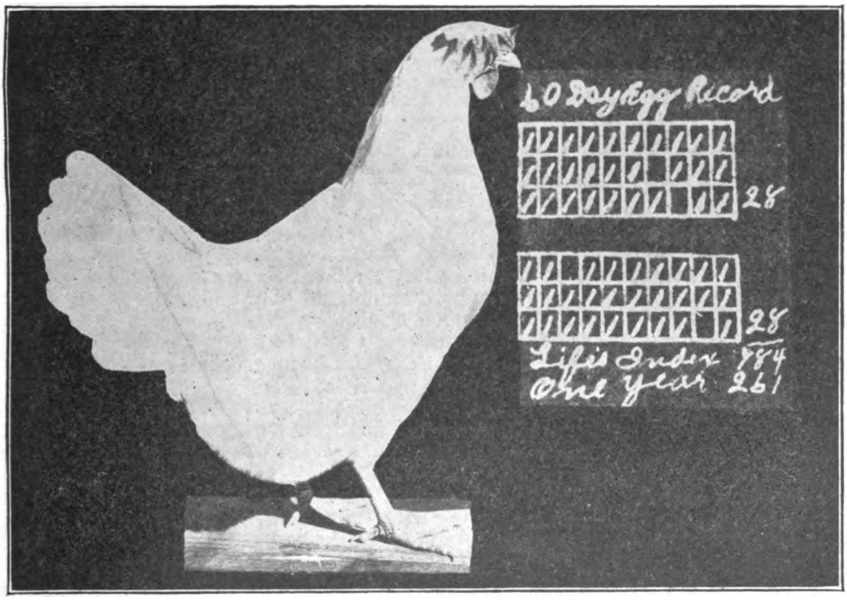
REPRODUCTION

Ever since the divine command to "Be fruitful and multiply, and replenish the earth" was given, Nature's most wonderful phenomenon has been in existence. The brightest minds of all ages have stood puzzled and awed, unable to solve the mystery of the beginnings of life, or reproduction. Much has been learned, however, regarding the principles or laws which govern reproduction with respect to the qualities and characteristics of the offspring. These, it is the purpose of this lesson to discuss.

While scientists and investigators are by no means a unit as to the exact workings of all these principles and laws, nor of their relations to each other, yet their existence is universally recognized, and the methods and lines of action of the more elemental and important of them are fairly well understood.

ASEXUAL REPRODUCTION

There are two kinds of reproduction, asexual and sexual. Asexual (which really means, "not sexual") reproduction is the original and primary form of reproduction. Asexual reproduction is accomplished by self-division, the parts which separate being equally developed. This form of reproduction is found only in the most simple forms of animal life. In plant life it is more common. The horticulturalist, when he has succeeded in producing a tree which bears fruit of unusual quality, perpetuates and multiplies that



Hen No. 8122 laid fifty-six eggs in sixty consecutive days as shown above. She has an index value of 261 eggs in one year, or 784 eggs during her lifetime. This hen won first prize at the Mountain Grove, Mo., Poultry show, and four of her pullets were in the first prize pen at the Missouri State Fair. This is more evidence that fancy and utility can be combined in the same fowl.

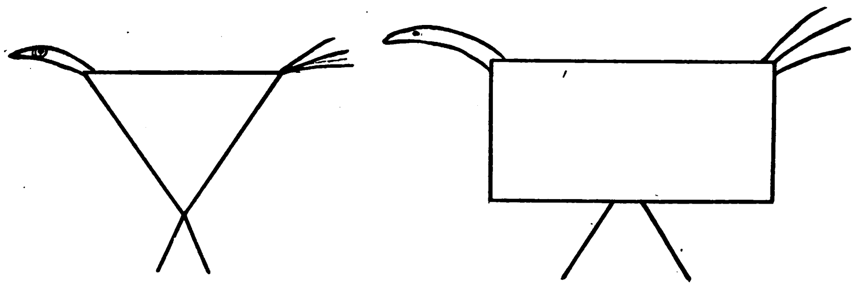
tree by making cuttings of it,—an example of asexual reproduction. If the poultryman could make use of asexual reproduction,—if he could cut a piece off from a very fine rooster and cause it to grow into another rooster of equal perfection, many of his trials and tribulations would be over. But inasmuch as he cannot do this, he must make a life study of the laws governing selection, mating and breeding.

SEXUAL REPRODUCTION

In all sexual reproduction the new life begins with the uniting of a male and a female germ. The physiological aspect of sexual reproduction in poultry is thoroughly discussed in the Baby Chick lesson, so it need not be repeated here. The Biological aspect is discussed under "Mendal's Law" in this lesson.

THREE FORCES AT WORK

The traits and characteristics of every individual, both mental and physical, are the combined result of three general groups of forces, or influences, as we may choose to call them. Stating it another way, there are three sets of principles or laws, which, working together, produce individuality, with the result that no two creatures are exactly alike. Were it not for these forces, working both for and against each other, the world would be filled



These figures, while very crude, represent an important fact which we wish to convey to you. On the left you will see the outline of a bird which is more or less triangular in shape. The figure represents a bird that has no breast and very little body. The legs are close together, and a bird that is triangular in shape, as shown above, will be one that will be very low in vitality. On the right we show a bird that is more or less rectangular in shape. It represents a bird which has a longer body, larger digestive and egg organs, and is able to consume and digest a lot of feed. The legs are further apart and the figure represents strength and vitality.

with monotonous uniformity. All men would be exact counterparts of one another, all animals of each species exactly alike in every particular,—every chicken an exact duplicate of every other chicken. In this connection, it is important that it be clearly understood that these three groups of influences do not act separately or independently of one another. They intermingle and combine in such a way that it is often times exceedingly difficult to trace the results of each in the animal organism.

The first of these groups of influences have to do with all characteristics which are transmitted from parent to offspring, from generation to generation. Influences and laws of this nature are classified under the general term, *Heredity.*

The second group of forces determine all characteristics which are due to the external conditions surrounding each individual. Forces of this nature are group under the heading, *Environment.*

The third set of influences or forces are those which have to do with all characteristics which are functional in nature, such as egg production, ability to lay on fat, etc. This set of influences are known as *Functional Activities.*

HEREDITY

Webster defines Heredity as, "The name given to the generalization drawn from the observed fact that animals and plants closely resemble their

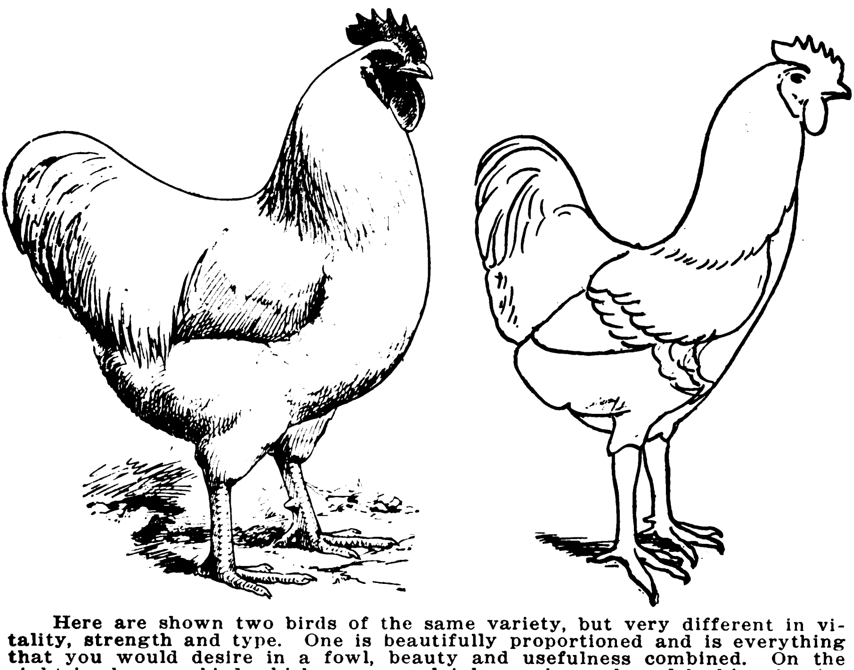
progenitors." "Like produces like," is the phrase by which the law of Heredity is most often expressed. In other words, if you set a hen egg, you feel certain that, if the egg hatches at all, the result will be a chick rather than a mud turtle or snake. To be still more definite, if you set an egg from a Plymouth Rock hen you expect that the resulting progeny will be Plymouth Rock rather than a Wyandotte or a Rhode Island Red.

In the lower forms of animal life the maxim that "like produces like" holds absolutely true, so far as human observation has been able to penetrate. But in the higher forms of animal life, where the organisms grow constantly more complex, and the size and difference between the fully developed organism and the part which separates from the parent body in reproduction becomes continually greater an increasing variation is noticed between the parent and the matured progeny. In other words, the law that "like produces like," while holding true in a general way, is not found to be applicable to every detail. For instance, where a single cock is mated with a single hen of the same variety, the chicks from the mating, while resembling each other, are not uniform in every detail.

The law of Heredity not only holds true with regard to the body form and color markings of poultry, but it also embraces all of the powers, qualities and characteristics of poultry. For instance, it affects all the internal bodily functions, such as the development of the digestive system, the texture and structure of the various parts of the body, the capacity for consuming food, and even the powers of reproduction. This being true, the importance of carefully selecting and mating our flocks becomes at once apparent.

EFFECT OF DISEASE ON BREEDING STOCK

Disease, and the predisposition to disease, have been found to be inherited in many instances. Diseases like White Diarrhoea are directly trans-



Here are shown two birds of the same variety, but very different in vitality, strength and type. One is beautifully proportioned and is everything that you would desire in a fowl, beauty and usefulness combined. On the right is shown a bird which you can plainly see is weak and lacking in size of body and vitality. The body is short, the tail is carried high, the back is very short, and the breast is lacking in depth and shape. A mistake made in the breeding pen in one season may upset and offset all of the care that you have given to selection and breeding for a period of several years. By making a mistake of this kind you can usually do more harm than you can do good in several years' breeding.

missable, through the egg, to the progeny. Such diseases as Roup, Tuberculosis, and Cholera, if they do not kill the birds outright, so weaken and effect them that their progeny, through Heredity, are brought into the world with a weakness, or a predisposition, which causes them to fall an easy prey to these same diseases. If both parents are affected, the young fall prey all the more easily.

A hen may be held back and prevented from laying as many eggs as she would have done had she been kept in good condition and given proper care and treatment, but when she does reach a normal state of health and condition, she will make up for much of the time she lost, if she is properly bred. One of the highest laying pens in the National Egg Laying Contest was bred from a male bird which had one eye put out by roup. We do not recommend this practice, however, because it is unsafe. A bird may recover but the offspring too often shows a tendency to the same disease.

It must be remembered that a chick with a strong constitution is better equipped for fighting disease than a weak chicken with access to all the medicines and condiments known to the medical science. Therefore, breed for constitutional vigor.

Many disease germs are transmitted from parent to offspring, so all diseased birds, or any birds which ever have been diseased, should be removed from the flock. We recently had a striking example of high vitality and low vitality. Two pens were housed in the same house, drank from the same pan, ate the same kind of food and slept under the same roof. One pen could not stand the test and every one of them were sent to the hospital. The pen on the opposite side withstood the severe weather, kept in splendid health, and was among the very highest pens in egg production.

ATAVISM

There are two sets of influences, influences which are both internal and inherited, which continually tend to counteract the law that "like produces like." The first of these sets we call "*Atavism*." "Throwing back," is the way the average person speaks of Atavism. In other words, offspring are often noticed to show certain characteristics which did not appear in either of the parents, perhaps not even in the grand parents, but which are known to have appeared in some more ancient ancestors. For instance, we recently mated three supposedly pure white breeds in making a certain cross. Some of the chicks were solid black, others mixed black and white.

Many examples of Atavism are seen in the poultry world. For instance, feathers and down on the shanks and between the toes of Orpingtons and other clean-legged varieties, are due to Atavism. Some of the ancestors of these varieties had feathers on their legs, with the result that this characteristic tends to "crop out," even after many generations. Another example of Atavism is the throwing of single combed sports by the various rose combed varieties. Certain of the ancestors of these varieties had single combs, with the result that this tendency still remains from generation to generation.

There is only one thing to do in dealing with the undesirable traits which are continually cropping out, due to Atavism. That one thing is to rigidly discard all birds showing these undesirable traits. Such birds should never, under any consideration, be used for breeding purposes. By strictly adhering to this rule, using only birds which do not exhibit atavistic tendencies, the undesirable traits and characteristics will appear less and less often, until they disappear entirely, so far as all practical purposes are concerned. This acts as a prod to keep breeders from being careless in their matings.

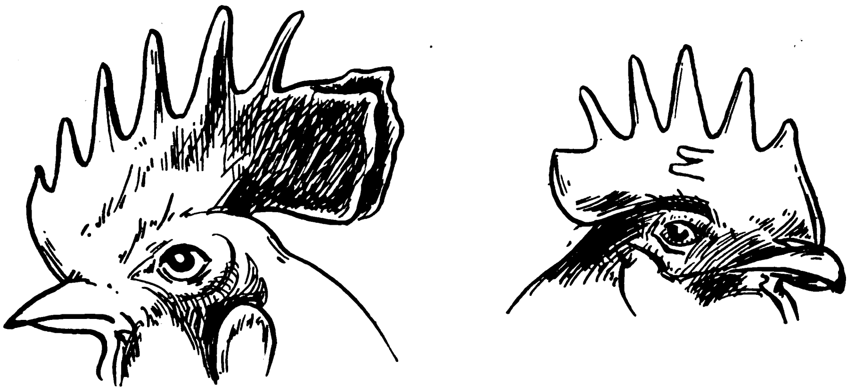
LIKE PRODUCES LIKE TO WHAT EXTENT

The degree of likeness of the offspring to its parents will be governed largely by the degree of prepotency possessed by either or both. The parent possessing the greatest prepotency will be more closely resembled by the offspring. The results of any mating and the ideals embodied in that mating will be strong "in proportion to the purity of the breeding in one or both parents ,and in proportion to the time that they have bred pure, in proportion to the closeness of the blood relationship in the parents, and in

proportion to the nearness of the resemblance of the parents to one another in structure and form and in all leading characteristics." The more closely the parents are related and the more nearly they resemble one another, the more nearly the offspring will resemble the parents. The action of this law does not apply only to feathers and shape, but to productiveness, disposition, and all other characteristics.

PREPOTENCY

The second group of internal, inherited influences that tend to counteract the law that "like produces like" is *Prepotency*. A fowl is said to be prepotent when it is found to have the power of transmitting, to a marked degree, certain of its qualities to the offspring. It is this prepotency, due to long years of careful breeding, that makes the pure-bred of greater value



This shows a head, on the left, where the blade of the comb is split. This is a very serious defect, and you will also note that there are six spikes instead of five, and most of these are slender and out of proportion. On the right is shown a comb that has two small spikes growing out from the side of the comb. If you breed from a bird of this kind, the defect will show up in a majority of the offspring. This is also a disqualification in a show room.

than the mongrel of mixed breeding. The farmer with a flock of nondescript mongrel hens, desiring to improve the quality of his flock, buys pure-bred males on account of their prepotency,—their power to transmit their good qualities to their progeny to a high degree. Individuals, even among the same breed and variety, vary greatly in prepotency. This variation is due in some measure, at least, first, to a difference in the constitutional vigor of the individuals, and second, to the purity of the blood lines. The line bred bird will, in nine cases out of ten, be found to be far more prepotent than a bird of the same variety with apparently the same amount of vigor, but with mixed blood lines.

Minor things which affect or influence prepotency are such as males having feminine heads or females that have heads which appear masculine.

In either case they usually fail to give satisfaction as breeders. Male Seabright bantams which have a tendency to have sickle feathers in their tails are better breeders than those that have tails which resemble hen tails in shape and markings. The Standard calls for hen-formed tails, however, and we have to breed them that way to win in the show room. The variety of fowls which are devoid of tails, known as Rumples, lay eggs of which a large per cent are infertile.

The fact that fowls are line bred and closely related does not guarantee prepotency in every case, nor does it guarantee an equal degree of prepotency.

Very often a male bird may be well bred, but he is lacking in many qualities of both shape and color, so much so that he would not even be considered as a show bird. Yet this same bird might be able to transmit the good qualities of its ancestors and prove to be an exceptional breeder of prize winning chickens.

The quality of prepotency is especially desirable in the male. Most all poultry raisers pay good prices for their males, they select them with special care, and they depend upon the male usually for any desired improvement in their flocks. But it is important that the females be selected with equal care. If you find a cock bird that has proven a good breeder, he is much more valuable and you are taking less chances than you would be with

This represents a slipped wing. The first three or four flight feathers of a wing are not folded up and under the wing proper when the bird has its wing in place by the side of its body. These feathers show from the outside and are very often twisted. This is a very serious defect and one that should never be bred from. In the majority of cases, birds produced from such stock as this will be poor egg producers. Never use such a bird in your breeding pen, if you can avoid it.

any cockerel, and you would make a serious mistake to dispose of such a bird until he had passed the limit of his usefulness.

Walter Hogan and many who have tested his system state that his method of testing the prepotency of any fowl is the most important and valuable chapter in his book, "The Call of the Hen." We have made some experiments along that line and can say that the system is dependable.

ENVIRONMENT

Having briefly considered the internal and inherited influences which are at work in every individual, either for good or ill, we come now to a second, and extremely important factor,—important because it can be largely controlled by the breeder, instead of having to rely on the somewhat obscure workings of Nature's laws. The important factor is summed up in one word, *Environment.*

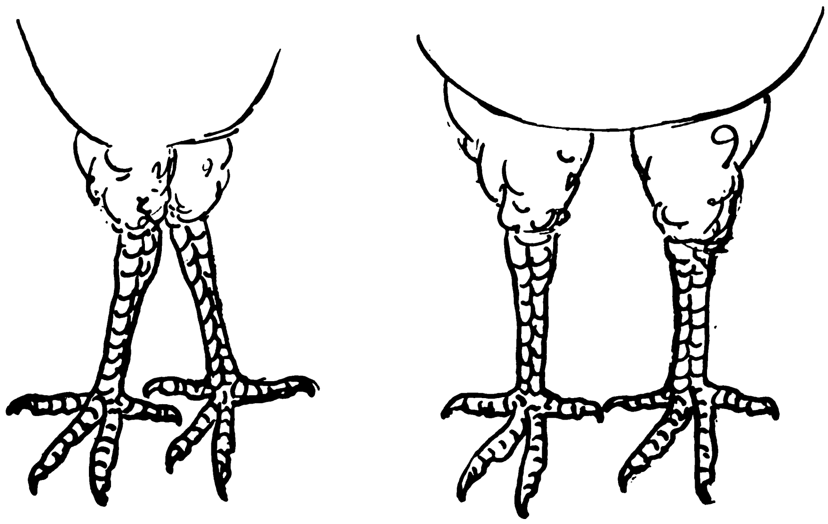
Environment may be defined as "The aggregate of all the external conditions and influences affecting the life of an individual." Environment may be roughly divided into two kinds,—Natural and Artificial. The natural environment of poultry, for instance, varies with regard to the geographical

location of their home, climate, weather conditions, etc. These all play an important part in determining the quality and characteristics of poultry.

Artificial environment consists of the surroundings and conditions which the breeder sees his way clear to provide for his birds. It is, to a great extent, the character of this artificial environment which will determine the success or failure of every person who engages in the poultry business. Conditions of environment which, in any way, cause discomfort, always check the development and growth and thus result in impaired vigor and breeding quality. The same is true of surroundings which are in any way unhealthy.

The matter of food is another exceedingly important part of artificial environment, although one has to stretch a point to include it under this heading. It is absolutely essential that food be wholesome and of the sort naturally adapted to poultry, as well as providing the proper food constituents.

Many amateurs have complained, after buying high grade eggs for hatching, that the progeny did not develop into birds of anywhere near as high quality as the parents. In some cases, at least, these faults will be found



On the left is shown a bird with knock knees, and one that has a very narrow slender body. This indicates weakness and a male or female of this type should never be bred. On the right we see a bird of exactly the opposite type. Broad between the legs and stoutly built, and a broad, deep body. Characteristics of this sort should be carefully looked after in the selection of birds for the breeding pen.

to be due to something wrong with the environment which has surrounded the birds even before the time that they were hatched.

Care and feeding have a great deal to do with the improvement of any breed or variety. No human skill can accomplish some things which are accomplished in the breeding world, without proper attention being paid to the important question of feeding, housing, care and management. The highest state of perfection comes through selection and breeding, but we would never have been able to produce the improved Poland Chinas and Berkshires from the "Razor Backs," nor could we have produced from the jungle fowl the 304-egg hen, Lady Lay More, without generation after generation being kept in the proper environment, as well as being carefully selected and bred.

Yet the performance of every flock may reach its normal average and the limit of its capacity or ability to produce. Better methods of feeding, housing, care and management have no further effect upon the egg yield. Then it is that greater production must depend upon the skill of the poultryman in selection and breeding. He must select the best blood in his own

flock or depend upon blood from an outside flock which is stronger in the desired characteristics than he has in his own.

There is no need of any poultryman's going at this problem blindly. There is enough information at hand so that poultry breeding is becoming more and more a science and less and less a matter of chance, but in spite of this fact, many cling to the idea that improvement is to be brought about chiefly through feeding. Because of the prevalence of this view, very many of the breeders of poultry do the work in an aimless way. As a result, the scrub is still in evidence on too many farms.

HOW DO BREEDING AND FEEDING AFFECT THE PROFITS

The only profit you receive from your fowls comes from the food which is assimilated beyond the amount needed for substance. A certain amount of food is needed and required to keep the machinery of the body in operation. No profit accrues from this. Your profit comes from the food they consume in excess of maintenance. If your hens are properly bred so that they can consume lots of food and make good use of it and not store it in their bodies in the shape of fat, the more food they consume the greater the profit they will make you.

FUNCTIONAL ACTIVITIES

The third of the three great groups of influences which combine to make every individual different from every other individual has been termed by students of animal breeding as "*Functional Activities*." Prof. Brigham, in his "Progressive Poultry Culture," has covered this subject so well that we quote him as follows:

"As soon as the chick develops organs for blood circulation, food digestion and muscles for moving, there comes into play another set of influences in the life of the creature. It begins to use its powers, and the use of the parts tends to increase their size and capacity. Healthy, natural exercise of the functions of the bird's body tends to the best development and maintenance of these functions. Excessive use or abuse of any of these powers tends to react disastrously upon the functions and upon the bird's whole organism.

"This matter is very largely within the control of the poultry breeder. For example, he may, by early hatching and high feeding, cause his pullets to develop rapidly and begin laying while still quite young. The eggs of these precocious pullets will be found lacking in hatching quality to a considerable degree, if the attempt is made to incubate them. If some of the eggs yield chicks, they will usually prove weaklings. Moreover, the pullets, after laying awhile, will very likely begin to moult and delay further egg-production until the following spring, the natural nesting time of the birds. Thus, even in a commercial way, the pullets prove the futility of the poultryman's plan for forcing egg-production at the expense of the development of the other functions.

"Again, the poultryman may, by close confinement of his adult fowls and too generous a diet, especially of Indian corn, induce habits of laziness in his flock. The fowls lay on fat, their eggs become infertile; later, egg-laying stops altogether, the birds stand about in idleness, they get listless, their systems become clogged, they topple over and die of apoplexy. An entirely different result is secured simply by compelling the hens to take bodily exercise. By making them scratch for at last a part of thir living the circulation of the blood is increased, digestion is improved, there is flesh formation instead of fat disposition, and active operation of all of the bodily functions. The fowls are lively, sprightly and healthy. Their eggs prove to be fertile and yield chicks which are vigorous, thrifty growers."

SOME INFLUENCES WHICH AFFECT FERTILITY

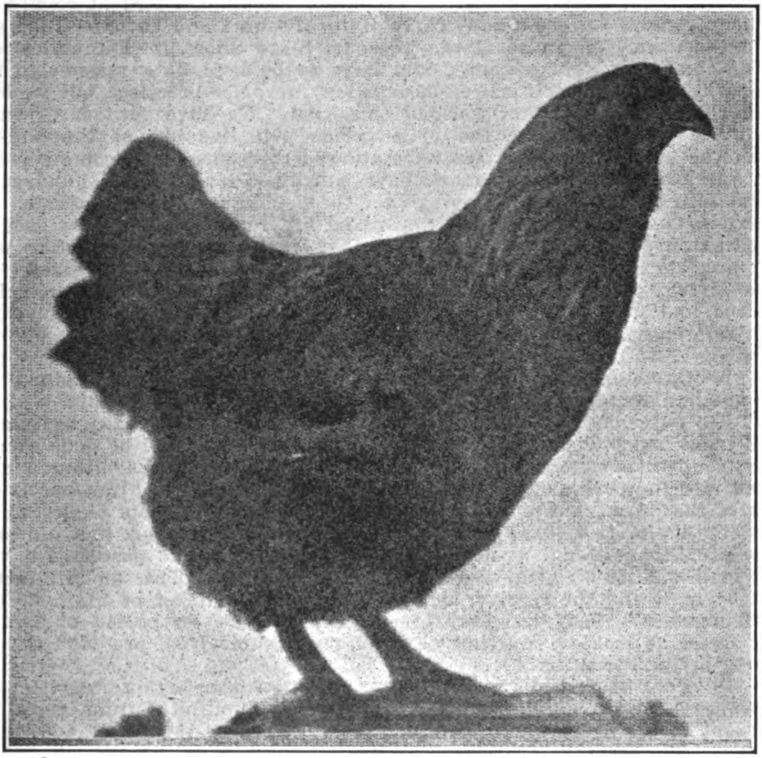
Confinement and lack of exercise will affect the male and, also, cause barrenness in the females. We have in captivity a number of wild ducks, wild geese and wild turkeys. The ducks failed to breed at all the first year after being caught, and the eggs from all are largely infertile.

Lack of uniformity in food supply and irregularity with which it is supplied affects fertility in some cases.

If the food supply is lacking in nutrition, or if it contains too much beef scraps, dry or moist mashes, or if fed too freely, the results are not usually the best.

If the birds are excessively fat, they are indifferent breeders, and if the eggs are fertilized at all, the chicks are lacking in size and stamina. Overly fat fowl often become sterile because of fatty degeneration of the reproductive organs.

It is a great mistake, after pullets have matured early and shown that they have the ability to lay, to continue to force those pullets to lay by



The above shows a pullet which was hatched from an egg which was fertilized by taking the semen from a Barred Plymouth Rock male and injecting it into the cloaca of a Light Brahma female. The germs then worked their way up the oviduct of the female and the eggs were fertilized. In doing this work, male birds were kept in wire pens where they could see females in the adjoining pens. The males were handled each day and they soon became very gentle, so much so that in a few days if we entered their pens with a female in our hand, the male would attempt to tread her while she was still in our possession. Instead of letting him connect with the female, we would slip our hand between the male and female and the semen would be caught in our hand, a glass dish or in a rubber bag. An ordinary medicine dropper with a rubber bulb was used to inject the semen into the cloca of the female. If you have a vigorous male, several females can be injected with the semen from a single male. This work I did at the Missouri State Poultry Experiment Station. This cross of a Barred Plymouth Rock on a Light Brahma, made a black fowl with a neck marked like a Brown Leghorn pullet.

heavy feeding, if you expect to use them for breeding purposes. As soon as your early laying pullets are discovered, put them on a maintenance ration, change their location, move them about and use other means to prevent them from laying many eggs until they are ready for the breeding pen. If the pullets mature early and they are forced to continue laying right

up to the breeding season, it will result in loss of stamina, infertile eggs, and death in the shell.

Lack of vigor from any cause will always decrease the fertility and increase dead germs.

ARTIFICIAL FERTILIZATION

We have been making some experiments along this line, and we have some living chicks which were hatched from eggs laid by hens that have never been allowed to run or come in contact with, or be treaded by a male bird. From what experiments we have made, I believe we can collect the semen from the champion Barred Plymouth Rock male bird at New York, Madison Square Garden Show, carry it to Missouri and then fertilize eggs from the champion pullet at the Missouri State Show, if that pullet is in laying condition. The semen would have to be kept at a reasonable temperature. Artificial fertilization of eggs may never be practical, but we learn other things as a result of work of this kind. We have been surprised to learn the length of time the male germs will live out of the body of either the male or female. We have allowed the semen to become perfectly dry, and after two hours or more, have moistened it and found hundreds of spermatoza still living and moving over the field under the microscope. Our experience has led us to believe that about 5 per cent of the males used for breeding purposes are perfectly sterile, that is, that their germs are so weak that they do not fertilize or else the semen is lacking in male germs. We have living chicks hatched from eggs artificially fertilized, artificially hatched, and artificiailly brooded. Some interesting facts are being developed with reference to this work and mention will be made on them in later reports.

The Oklahoma Experiment Station did considerable work along this line and in a circular issued by that institution, they had this to say:

"The question was, whether or not eggs could be fertilized by seminal fluid transferred from one female to another. If that could be done successfully, could a sample be diluted with a physiological salt solution and injected into the cloaca of several hens with equal success? From our knowledge of the life period of these cells and the number of them passed at one service, this latter method would appear very practical. And, if it did prove successful, there would be nothing to prevent a man who possessed a valuable male bird to stand his bird, as in stud breeding. The semen might be sent by mail and the receiver could treat a large number of his hens at a small expense. Poultry, unlike other animals, have no period of heat, so they could be treated any time samples may be received, provided the hen was in laying condition.

"In order to test out several hens known to be laying infertile eggs were treated in the manner suggested above with undiluted fluid, and a fair per cent of the eggs were fertile. These eggs were incubated and chicks hatched from them."

FERTILIZATION OF AN EGG AND THE INFLUENCE OF THE FIRST MATING UPON THE OFFSPRING OF SUBSEQUENT MATINGS

This question has been discussed pro and con by all who have made any observation along this line.

Country Gentleman is authority for the statement made by Mr. A. W. Frizzell of Maryland, to this effect: He had a pair of prize winning White Plymouth Rocks which were mated with a Light Brahma cock. Three years hence, he claims, Light Brahma markings still manifested themselves.

Some poultry breeders claim that a White Plymouth Rock pullet mated to a Langshan cockerel will show Langshan characteristics in the offspring of a later mating.

In order to test the grounds for such belief I made some experiments as follows:

Six pullets, which had never been with a male bird, were placed in a pen with a vigorous Houdan cockerel. The Houdan was very striking in characteristics, having a V-shaped comb, a crest, beard, and five toes, while the pullets had single combs, no crest or beard and four toes instead of five.

From this mating the eggs were incubated, the chicks examined, and the transmission of the four characteristics recorded. Thirty-seven chickens were examined from this mating and out of a possible 148 characteristics 91 were transmitted by the male and 79 by the females, making 170 characteristics recorded, there being 22 which showed both having a single comb in front and a V-shaped instead of blade, five toes on one foot and four on the other, etc.

The male showed that he was more than half the pen in the transmission of breed characteristics.

The Houdan male was taken out and the eggs incubated until all were infertile and the male left out for three more weeks to be sure there were

This illustrates a hen with a wry tail. The tail feathers are twisted to one side, which is usually the result of a deformity. If you breed from either males or females that are inclined to this defect, you will find that it will show in the offspring in a good many cases. A defect of this sort will disqualify any bird in a show room.

no Houdan male germs left with the hens. At this time a male was placed in the pen which had the same characteristics as the females, to see if the offspring would show any of the Houdan characteristics. Forty-five chickens were hatched and showed no signs of the Houdan. This test should perhaps have been more extensive, but this indicated that mating a bird of one breed with one of a different breed will not influence the offspring of a later mating. This would hold true with birds, but not necessarily true with higher animals, as the embryo of the bird, is developed in the egg outside the body of the mother, while that of higher animals is developed inside the body of the mother.

Fertilization of the egg takes place in the infundibulum or funnel of the oviduct just after the yolk has been freed from the follicle in the ovary and before being surrounded by the chalazae layer in the oviduct. The male germ does not develop or grow until it has united with the female cell. At the time the male and female cells unite the entire yolk is surrounded with albumen, shell membrane, and shell, so there is no inter-circulation either by osmosis, transfusion or any other way, between the embryo and the mother, while the embryo is developing.

With higher animals the embryonic stage of development is passed inside the body of the parent, so there is a possibility through osmosis of some of the blood of the developing embryo remaining with the mother, and in such case the mother would have part of the blood of the male of the first mating in her body which could transmit characteristics to the offspring of a later mating.

Other theories have been advanced that the sight of colored birds would influence the color of the offspring, i. e., a black male in a pen by the side of white females would influence the color of the offspring, but it has been my observation that for the black male to fly over the fence and remain for ten minutes will have more influence upon the color of the offspring than for them to look through the fence for ten years.

Summing up the tests, I am free to say that they have strengthened my belief in the law that "Like Produces Like," although, of course, freaks or sports may occur at any time in any line of breeding, and that both male and female contribute to the characteristics of the offspring, according to the blood they have in their bodies.

Many people are deceived because they do not know the breeding back of the birds with which they have made their observations.

PREDETERMINATION OF SEX THROUGH DIET

French scientists and biologists are searching for means of experimentation with animals to develop a method of predetermining and controlling the sex of offspring, which if as successful as present indications are, will be eventually applied to human beings.

The French biologist, Pezard, believes he will shortly be able to announce a scientific diet for hens by which they will breed male or female eggs at will.

From a paper by Dr. Pezard which has been submitted to the Academy of Science, arises the enormously interesting question:

"Can the alarming depopulation of the white section of the world be explained by excessive meat eating?"

Dr. Pezard has achieved some highly interesting results with grafting operations on roosters and hens which showed that the rooster's reproducing capacity as well as his fighting qualities dropped and even disappeared when fed a meat diet. Indeed, his interstitial glands became atrophied by this abnormal method of feeding.

Now, I would not go as far as to assert roundly that man ought to cease eating meat in the interests of race preservation, but there is no doubt whatever that gastro-intestinal trouble induced by bad dieting, such as too much meat, militates against healthy, normal reproduction. This is the very reason that I do not recommend feeding much meat or beef scraps to the breeding males or females.

Nutrition a Big Factor

"This is not surprising when we widen the question and consider that the measure of nutrition imparted to an egg is a factor in determining sex.

"Scientists know that in case of certain insects ill-nournished eggs give males, while normal eggs give females. We also know that hermaphrodites (combination of both sexes) with animal races are created through the disappearance of the distinctly male sex.

"Is it not a fact that we find among most animals the males are smaller and have less resistance than the females? The males' splendid energy and gay plumage merely denote that they are squanders of energy.

"There is something in the male's natural makeup that renders his variable and unstable type weakening in resistance to the forces of nature, and there is also a fragility in his reproductive capacity.

"Beyond doubt, woman is the stable element in our race.

"In accordance with the general embryological law, man is a mere by-product.

Female the Stronger

"It has been ascertained by observation among the lower types of invertebrates that while their species is invariably composed of male and female at inception, in many instances the male is unable to survive his natural

enemies, and disappears, while the females become hermaphrodites and persist in spite of the changes in their surroundings involving increased difficulty of nourishment.

"Females are more adaptable and able to assimilate food which does not actually nourish males. As a consequence, female embryos are better nourished than males, and therefore more numerous.

"In the lower order of life it appears that only a special kind of nourishment produces males, while any food assimilable by the mother animal is sufficient to breed female eggs.

"The scientists of France believe this theory can be extended so as to apply to the predetermination of the human sex.

"It is an interesting fact that the very adaptability of females of all species, high and low, makes them less active than males. The latter are engaged in a continual deployment of energy in order to seek the environment required for the sustenance and continuance of life, while females are able passively to accept adverse conditions by virtue of their superior vitality.

Theory Is False

"Centuries of race development have made males, engaged in a strenuous fight for existence, resourceful, active and self defensive, and this has resulted in the false theory of mental and physical superority of men over women.

"Let man take up the passive, sedentary existence of women, and he promptly tends to atrophy all his apparent faculties, and becomes effeminate and weak.

"It is evident from recent scientific researches that the female is the backbone of the human species.

"It is now certain beyond a shadow of doubt that the sex of the offspring is not determined at the instant of conception but depends upon subsequent influences, the most potent of which probably is the influence of nourishment.

"Bees are endowed with the secret for which man has been vainly searching for centuries. They produce with exact certitude 'queens,' 'drones' and infertile female workers in the required numerical proportions, and they do so by means of special nourishment of the larvae."

AVOID BREEDERS THAT ARE "BAGGY BEHIND."

Birds that are "baggy behind," those that have heavy, fat abdomens that have a tendency to fall below the point of the breast bone, should not be used in the breeding pen, as a rule. This is an indication of a weak ovarian system. Such birds are poor breeders, they do not fertilize their eggs, and the chickens from such hens often die in the shell or are weakly if they do hatch.

Many hens die with ovarian trouble, ruptured yolks, diseased ovaries, ruptured or diseased oviducts, and such deaths are usually attributed to some other cause. By making a post mortem examination, you can usually tell. If you find a hen that dies from such a cause, it is unwise to use either males or females for breeders that were bred from her, because this weakness seems to be hereditary.

MENDEL'S LAW

The most difficult phase of the subject of breeding is what is known as "Mendel's Law," or "Mendelism." Yet it is a subject of some importance to every person who wishes to breed poultry intelligently, and to produce specimens approaching perfection in bodily form or color markings.

No man in the history of the world, not excepting Charles Darwin, has done so much to reduce Nature's laws of reproduction to an exact science as the Austrian Monk, Charles Mendel. Mendel was born in 1822 and died in 1884. The experiments from which he evolved the now famous "Mendel's Law" were carried on for a number of years by crossing the various varieties of the ordinary garden pea. Let us see what he discovered, and how his discoveries have been applied to poultry breeding. We have never thought that Mendel's Law was as applicable to poultry breeding as to plant breeding and to the breeding of some other animals, but it is at least worthy of study.

The pea was chosen, first, because the separate flowers are self-fertilizing and are protected from insect interference, and second, because there are numerous varieties of the pea having distinct characters which breed true. Certain varieties have a yellow seed, while in other varieties the seed is green. When ripe, some varieties have smooth round seeds, while in others the seeds are angular, etc.

Mendel began his experiments by crossing pairs of varieties in such a way that the members of each pair differed from each other in one particular characteristic. For instance, a round seeded variety and an angular seeded variety were crossed. When the cross-bred plants had matured, it was found that all of the seeds were *round*. Likewise, in other experiments in crossing the various varieties of peas, it was found that only *one character* showed in the cross-bred individuals. These characters, which showed to the almost total exclusion of the other, Mendel called *Dominant*. The characters which failed to show in the cross-bred individuals he called *Recessive*. Take, for example, the pea experiment cited above: The character of roundness in the seeds was found to be "dominant," while the angular character of the seeds was found to be "recessive."

Experiments thus far carried on with poultry indicate that, as a *general rule*, rose combs are dominant over single combs; crested heads are dominant over smooth heads; red ear-lobes are dominant over white ear-lobes; black beaks are dominant over yellow, and yellow over horn; white skin is dominant over yellow; feathered shanks are dominant over clean shanks; white shanks are dominant over yellow, and black over yellow; white plumage is dominant over both black and colored plumage; black plumage is dominant over red; brown color in eggs is dominant over white. The tendency to broodiness is dominant over the non-sitting tendency.

However, to return again to Mendel and his peas, his most interesting experiments and important discoveries were still to follow. When the cross-bred peas were in turn crossed back on each other, it was found that there was a breaking up of the characters which were uniform in the first generation, so that the progeny of the second cross showed an average of three dominants to one recessive, i. e., three round seeds to one angular seed. When the seeds thus produced were sown, it was found that the angular (recessive) seeds in turn produced which were *all* angular. In other words, they bred *true to type*. They were pure. There was no taint of the cross so far as the contrasted characters, roundness and angularness were concerned.

The round (dominant) seeds of the second generation, while apparently pure, when planted, proved not to be pure. Only one-third of them were pure, the other two-thirds again producing an average of three round seeds to one angular seed. The round seeds of the second generation, then, were of two kinds,—those which carried only the round character, and those which carried both the round and the angular characters. Successive experiments with subsequent generations proved beyond the shadow of a reasonable doubt that the above results were typical,—that the pure dominants and the pure recessive always bred true like their parents, while the impure dominants bred dominants and recessives in the constant proportion of three to one.

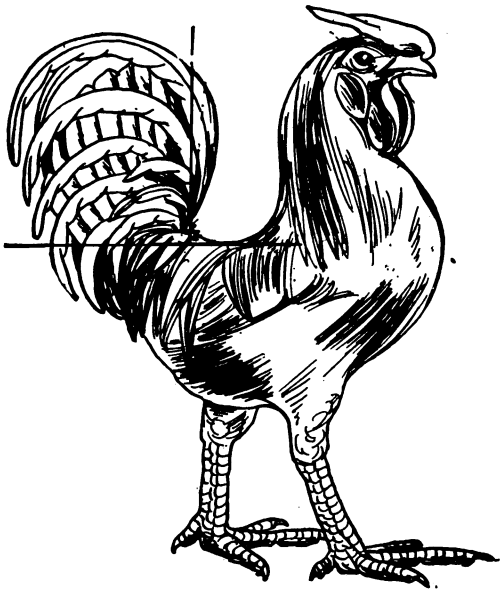
Mendel's Theory of Inheritance. Each individual has its beginning in the union of two miscroscopic cells,—a male or sperm cell, and a female or egg cell. "Ovium" is the correct name for the female cell. This being true, it is self-evident that the *physical basis* of inheritance lies in this union of the male and female cell.

Biologically speaking, both male and female cells are *gametes*. A cell formed by the union of a male and female gamete, i. e., the beginning of a new individual, is called a *zygote*. When a zygote is formed by the uniting of a male and female gamete *each bearing the same character*, as, for instance, the character of smoothness in the pea seed, such a zygote is known as a *homozygote*. On the other hand, when a zygote is formed by a male and a female gamete bearing characters which are not alike, as, for instance, the character of smoothness and the character of angularness in the pea seed, such a zygote is called a *heterozygote*.

A heterozygote may, or may not, bear the form of a pure dominant.

This can be determined only by a breeding test. A heterozygote also carries the recessive character. This, as has already been shown, is proven by the fact that when heterozygotes are crossed on each other, one-fourth of the offspring show recessive characters. It is only by this crossing that we can tell the heterozygote which is a pure dominant from the one which also carries a recessive character.

A familiar example of this phenomenon, in poultry, is the matter of transmitting rose and single combs. If a pair of rose comb birds produce a



A squirrel tail is one where the main tail featehrs or sickle feathers are carried forward of a perpendicular line, as you will see in the above illustration. Such a tail makes a very sudden break in the back line. It usually spoils the looks of a bird, and is a disqualification in most varieties when on exhibition in a show room. Many high layers have a tendency to carry their tails high, but this is more a question of carelessness in breeding and selection than a necessity for high production.

proportion of single comb offspring, one or both of the pair are heterozygote. Again, if a rose comb fowl and a single comb fowl are mated, and all the progeny are rose comb, the rose comb parent is pure, or homozygote. If, on the other hand, any of the progeny of this mating are single comb, the rose comb parent is heterozygote, because, as we have seen, if the rose comb parent was homozygote, all of the progeny would be rose comb.

As has already been shown, when first crosses are bred together, the resulting progeny show the original characters in the proportion of one pure dominant and one pure recessive homozygotes, to two heterozygotes bearing both of the unit characters. Now, if the breeder wishes to mate these heterozygote individuals back to either of the pure bred parents, which are homozygotes, he can easily tell beforehand the results of these matings, *provided* the characters sought for are truly Mendelian, i. e., are known to conform to Mendel's law. If mated to the parent showing the dominant character, half the offspring will be pure dominant, monozygotes, and half of the offspring will carry both the dominant and recessive characters—will be heterozygotes. Similiarly, if the heterozygotes above mentioned, are mated back to the parent showing the recessive characters, half of the offspring will be pure recessive, monozygotes, and the other half will carry both the recessive and dominant characters,—will be heterozygotes.

Mating Parents Differing in Two Pairs of Characters. In the foregoing paragraphs we have studied the results of mating parents differing only in a single pair of characters. Biologists speak of such a mating as an example of *Monohybridism.* The crossing of parents differing in two pairs of characters is spoken of as an example of *Dihybridism.* An example of Dihybridism would be the mating together of a Black Hamburg (rose comb) and a Single Comb White Leghorn. In such a cross it has been found that the rose comb is dominant over the single comb, and that the white plumage is dominant over the black. The results of this mating would be as follows:

Out of every sixteen chicks there would be, on the average, twelve white chicks and four black ones. Nine of the white ones would have rose combs, and three would have single combs. Three of the black ones would have rose combs, and one would have a single comb. It will be noted that in every case the proportion is that of three dominants to one recessive.

If the nine rose comb white chickens are in turn bred together, one only will breed pure rose comb whites—will be a homozygote in respect to both the rose comb and the white plumage. Two will throw a proportion of single comb whites. Two others will throw a proportion of rose comb blacks, and the other four will each throw all four combinations, i. e., single comb whites, rose comb whites, single comb blacks and rose comb blacks.

The unfortunate feature of the above results, is that the only way to determine which individuals would breed true and which would not, would be by actual breeding tests. The results of the experiment above outlined illustrates what is known as *Mendel's Law of Gametic Segregation.* In studying the above results it should be distinctly understood that they are *averages.* It should also be remembered that the scientific study of the principles and laws of animal breeding, *as applied to poultry,* has only just begun. Many discoveries along this line will undoubtedly be made during the next decade.

INBREEDING

Inbreeding, as generally referred to by poultrymen, means the breeding together of birds that are closely related for a number of successive years or generations. The objects of inbreeding are to secure more desirable qualities in our fowls, to secure more uniformity, and to secure them in the quickest possible manner.

The desirability of this practice and the good and evil therefrom have been discussed pro and con for many years. Practically the only objection offered is the belief that the offspring will be weak and sickly, lacking in strength, size and vigor. There is no denying the fact that if the parents have a common defect or a common weakness, these things will be more firmly fixed and intensified in the offspring. It is equally true that if both parents are strong and vigorous, and they are inbred, their good characters will also be more firmly fixed and intensified in their offspring.

Inbreeding, if carried too far, will result in loss of vigor, loss of size, and a tendency to delicacy and general deterioration. In the case of bantams, what we want is the lack of size. We want smallness, and by closely inbreeding this is accomplished. Thus we have an example in these little birds of the effect of inbreeding on size. There is no use to argue this question, for every observing poultryman has seen evidences of the evil effects of careless and constant inbreeding in his own flock and in those about him. If it is successfully practiced, it requires constant selection and ruthless culling.

Notwithstanding the above facts, it is true that no one can perfect a strain of his own or firmly fix desired characteristics uniformly throughout his flock, without resorting to more or less inbreeding at first, and then following that with a reasonable amount of line breeding.

No matter how wisely it may be conducted, certain evils will surely grow out of continual inbreeding. This practice should be discontinued before these evils appear, and no one should attempt to inbreed their poultry who does not understand it, or who might practice it in a haphazard manner.

LINE BREEDING

A great many experienced poultry breeders do not seem to have a clear understanding of the subject of Line Breeding, its objects, how it is accomplished, etc. Yet it is a matter of very great importance, especially to breeders of Standard poultry.

Line Breeding, as the name indicates, means breeding in line,—restricting the mating of individuals to a certain family, or a limited number of females with a common origin, or of a similar type. There is some confusion in the minds of many as to the distinction between Inbreeding (sometimes called "Close Breeding"), and Line Breeding. Inbreeding is more intensive than Line Breeding. As the terms are generally used, the distinction between them is exceedingly fine. The mating together of own brothers and sisters would be called Inbreeding, while the mating together of sire and daughter, or of dam and son, would be Line Breeding. The mating together of brother and sister does not produce any change in the relative proportion of blood of the grand parents in the offspring. Therefore, there can be no improvement or progress. The mating of sire and daughter, or dam and son, increases the proportion of the blood of one daughter, or of dam and son, increases the proportion of the blood of one ancestor or the other, as the case may be,—and therein lies the distinction between Inbreeding and Line Breeding.

The Purpose of Line Breeding. The main purpose of Line Breeding is to improve the quality of one's stock for either color or shape by keeping in the flock the blood of some ancestor of special merit. The longer Line Breeding is carried on, and the larger the proportion of the blood of the original ancestor in the flock, the stronger will be the tendency to reproduce his or her good qualities, and the more uniform will be the workings of the law that "like produces like." Line Breeding, intelligently carried on for a series of years, results in the establishing of a strain or "family" with a common origin, and of more than ordinary excellence This should be the ultimate aim and ambition of every person who goes into the pure bred poultry business.

Line Breeding Illustrated. The illustration shown herewith is known as the "Felch Line Breeding Chart," it having been originated by that veteran poultryman, Judge I. K. Felch. To him is due the honor of first making the subject of Line Breeding so clear that the amateur can understand and practice it. The following is Mr. Felch's own explanation of the chart:

"Each dotted line represents the female as having been connected, upper group, while the solid line shows the male as having been taken from the indicated upper group. Each circle represents the progeny, to-wit: Female No. 1 mated with male No. 2 produces group No. 3, which is half the blood of sire and dam.

"Females from group No. 3, mated back to their own sire, No. 2, produce group No. 5, which is three-quarters of the blood of the sire, No. 2, and one-fourth the blood of the dam, No. 1.

"A male from group No. 3, mated back to his own dam, No. 1, produces group No. 4, which is three-fourths of the blood of the dam, No. 1, and one-fourth the blood of the sire, No. 2.

"Again select a cockerel from group No. 5 and a pullet from group No. 4, or vice versa, which will produce group No. 7. This is mathematically half the blood of each of the original pair, No. 1, and No. 2. This is a second step toward producing a new line.

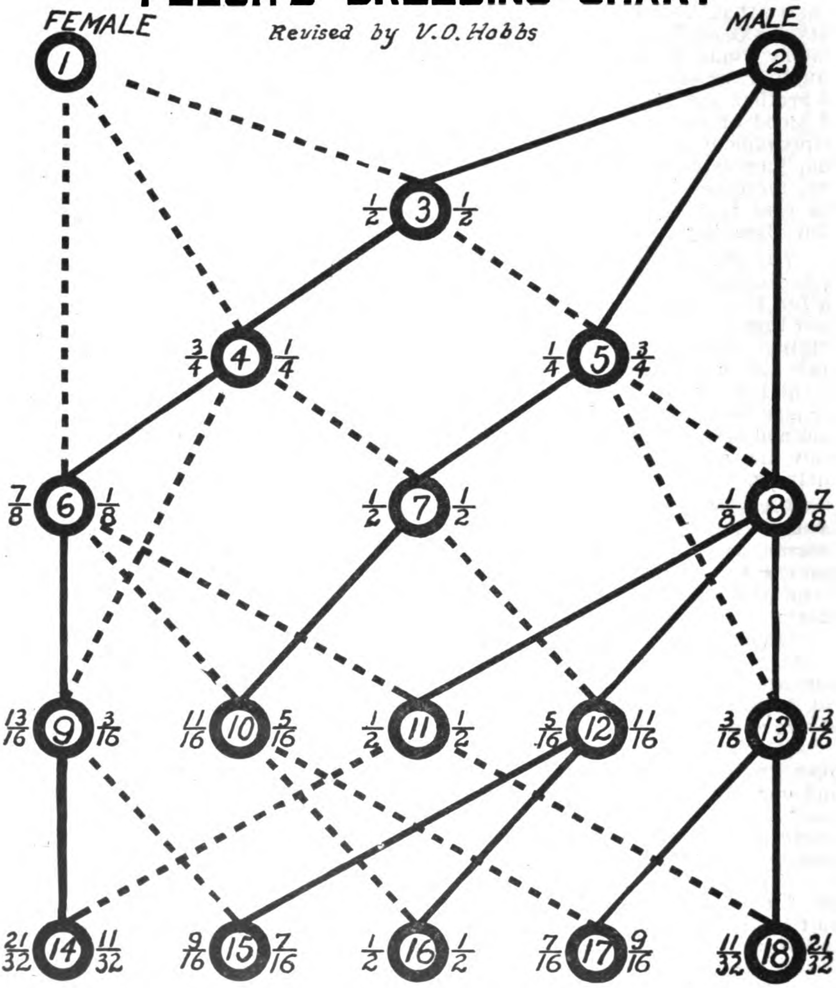
"Females from No. 5 mated back to the original male, No. 2, produce group No. 8, that are seven-eighths the blood of No. 2. A cockerel from No. 4, mated to the original dam, No. 1, produces group No. 6, that is seven-eighths the blood of the original dam, and only one-eighth of the blood of the original sire.

"Again we select a male from No. 8 and females from No. 6 and for a third time produce chicks (in group No. 11) that are half the blood of each of the original pair. This is the third step and the seventh mating in securing complete breeding of our new strain. In all this we have not broken the line of sires, for every one has come from a group in which the

preponderance of the blood was that of the original sire. Nos. 2, 8, 13 and 18 are virtually the blood of No. 2.

"We have reached a point where we may wish to establish a male line whose blood is virtually that of the original dam, and we now select from No. 6, a male which we mate with a female from No. 4, and produce group No. 9, which is thirteen-sixteenths the blood of the original dam, No. 1, and three-sixteenths the blood of the original sire, thus preserving the strain of blood of the dam.

FELCH'S BREEDING CHART



"A male from No. 13, which is thirteen-sixteenths the blood of the original sire, No. 2, mated to females from No. 10, which are five-sixteenths the blood of the original sire, No. 2, gives us group No. 17, which is nine-sixteenths the blood of said sire, while in No. 16 we have the new strain, and in No. 18, the strain of our original sire, No. 2. Thus we have three distinct strains, and by and with this systematic use we can go on breeding for all time to come. Remember that each dotted line is a female selection and each solid line the male selection.

"If you do not use care and make rigid selections in line breeding, it will intensify and magnify the defects in your flock to the same extent it does the desirable qualities. The defects become so incorporated that it is hard to breed them out. Neither should line breeding be carried to excess. In time you will meet the same evils that you do in inbreeding. No matter what system of breeding you may follow, as soon as you discover any signs of lack of vigor or deterioration in any way, you should take this as a danger signal and change your methods. It is advisable to line breed Barred Plymouth Rocks, Rhode Island Reds, Brown Leghorns, and several other varieties. Stay within the same line and the same strain as much as possible if you expect to breed prize winners.

THE MAIN LAW OF NATURE IS LINE BREEDING

"Line Breeding is the main law in the breeding of domestic animals," said W. H. Card in Reliable Poultry Journal. Mr. Card has given great study to breeding problems and it is advisable to give you his words: "Perhaps we can make this better understood by explaining the different phases of breeding, of which there are four methods generally practiced in the breeding of domestic animals, namely, cross breeding, out-breeding, inbreeding and line breeding.

"Cross breeding is the union of two breeds of the same species, as a Langshan bred to a Brown Leghorn (this has no relation to hybridism, which is a phase of cross breeding that is very uncommon and is the union of totally different species of fowl or animals, such as mating a guinea fowl to a Barred Plymouth Rock, therefore such 'cross breeding' is not pertinent to this discussion). The results of cross breeding are not beneficial in any way beyond the first cross, and is practiced only for market results.

"Out-breeding is the union of domestic animals or fowls of the same variety or breed, the members of the mating being entirely unrelated. Intelligent out-breeding produces the highest results in vigor and stamina, yet it is not a dependable method in reproducing characteristics of form, color, inbreeding and line breeding.

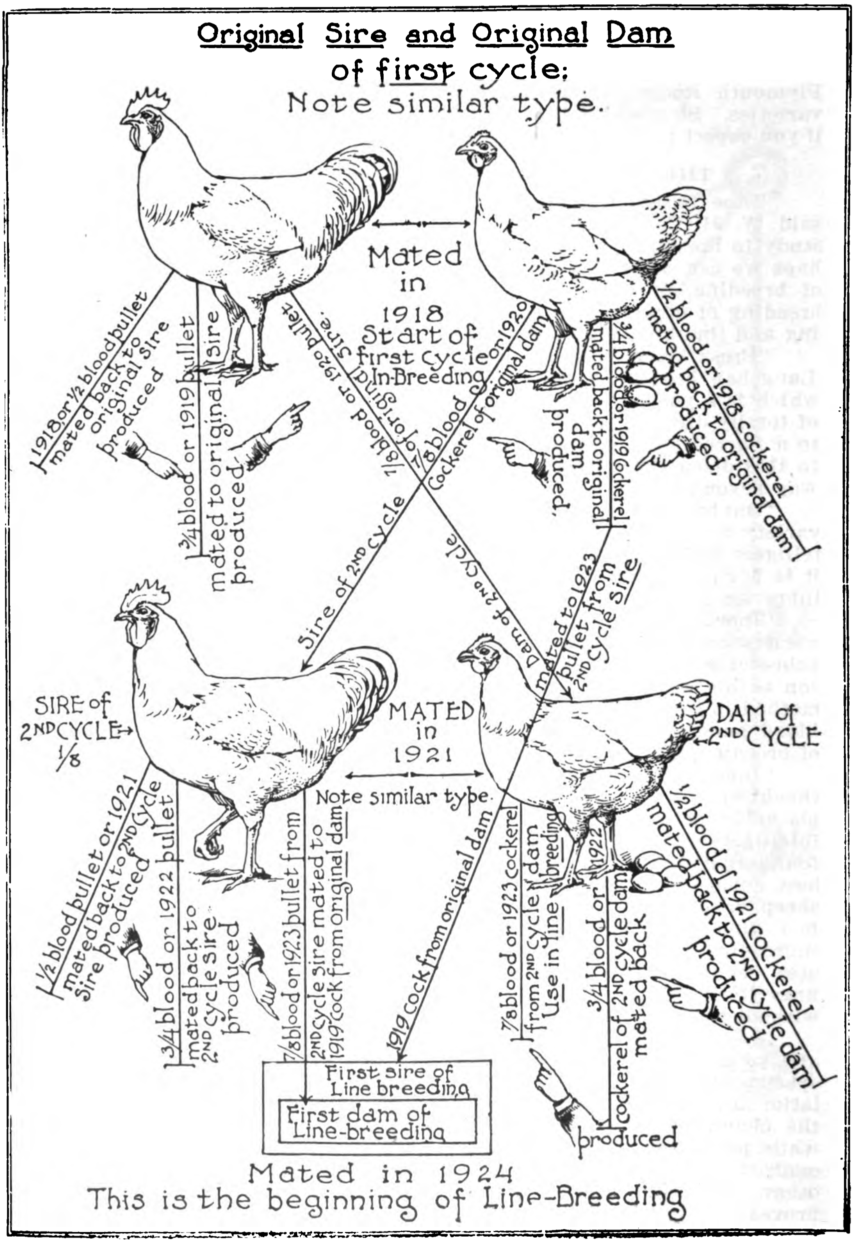
"Inbreeding is the union of domestic animals or fowls of the same variety or breed that are more or less closely related. We speak of close inbreeding, which is the breeding back to the sire of his daughter, the son to his dam, or brother and sister. Inbreeding is the beginning of the method in the breeding of domestic animals or fowls which leads to domestic blood purity and is the chief factor in the establishment of the great law of breeding of domestic animals, namely, line breeding.

"Inbreeding is a dangerous path to follow, being full of pitfalls for the unwary and the novice, mainly because of that mysterious and unexplainable deterioration which accompanies its practice; yet careful and intelligent selection of specimens for their vigor and stamina builds a foundation upon which we may practice line breeding which produces the best domestic animals, whether you are working with cattle, horses, swine, sheep or poultry. Only by inbreeding can we establish line breeding; in fact, line breeding properly defined is inbreeding, but it is the kind of inbreeding that safeguards stamina and vigor and that fixes and perpetuates desired characteristics and enhances prepotency. Line breeding defines itself. It is breeding in line or continuing a long line of ancestry without the introduction of foreign blood.

"In judicious line breeding the selecting of the birds for their vigor and stamina in every mating is the safeguard against deterioration because specimens so selected, while entirely related, are the farthest removed in relationship by the long time produced by inbreeding. Line breeding through the channel of close inbreeding, fixes family traits of form and color and while perfecting the breed, also establishes strains of the breeds with a recognized individuality or family resemblance that differentiates them from other strains of the same breed that are bred to the same standard. That proves the great value of persistent line breeding according to Standard requirements.

"In breeding and line breeding may be called purity breeding, because it drives out all undesirable characteristics or traits, thus blending the desired characteristics of color and form in what may be called a pure-bred

breed with self-made characteristics born of the purity or oneness of blood. This is accomplished by pouring the parent blood into the blood of its own progeny and continuing this until the line is established or until enough individuals are created to breed back in safety, being far enough removed in



This line breeding chart was prepared by W. H. Card and was published in the Reliable Poultry Journal. The chart is self-explanatory of Mr. Card's successful system of line breeding.

relationship to insure vigor without the infusion of new or unrelated blood. Instances are numerous of unbroken lines of breeding extending over ten to thirty years where the vigor and stamina, size and worth have been sustained without the infusion of one drop of new or unrelated blood.

SOME EXAMPLES OF LINE BREEDING

"My first experience in line breeding or inbreeding covered a period of sixteen years, during which I tried the Plain Golden Polish. During that time no new blood was used, yet the size of the fowl increased surprisingly, with great uniformity of color and markings and no apparent loss of vigor. In originating my own new variety, the White Laced Red Cornish, I was obliged to breed back to one sire five years (until this sire was the great great grandfather of his own daughters) in order to establish a variety that had a color all its own, yet today this variety is as vigorous as any variety with a century of pure breeding back of it, which proves conclusively that there are no two ways to go about the establishment of a new breed or variety—there is simply one way and one only, and that is—line breeding.

"One great Barred Rock breeder asserts that he can mate his Barred Rocks as he chooses and get good results because of their many years of line breeding. The reason for this is the purity of the blood of his strain from which all foreign elements have been purged.

"The brilliant and even red plumage and oblong type of the Rhode Island Red, so deservedly popular in our shows and on poultry plants, is the result of but two decades of careful selection and judicious line breeding by our Standard of Perfection.

"The same law produced the popular Orpingtons and placed them in the van as pure-bred fowls in the short space of time that has elapsed since their origin. Among fowls of older ancestry such as the Dorkings, Houdans, Cornish and the far-famed Sebright bantam, with its two hundred years of history—they owe all to this wonderful factor—line breeding. It is a real reason for their existence today because it works for the survival of the fittest in domestic fowls with a surety nearly equal to the eternal survival of the fittest among the wild species, in which case there is no problem of breeding.

"From my experiments and study of breeding problems, I have found that line breeding and inbreeding solve the whole riddle of Nature as applied to domestic fowls. Many of its puzzles were worked out in darkness of perception and travail of spirit and mind until continued proof, offered by experiments, convinced me that the continued practice of line breeding or inbreeding is the only method by which to produce high-class fowls with such near purity of blood that its prepotency will be sufficient to carry out Nature's desire and aim in regard to animal life, namely, that like shall beget like.

"With an earnest desire to help our fellow breeders to enhance the quality, the purity and the worth of our domestic poultry, I submit a chart which more fully explains judicious line breeding than is possible by words. Please remember we must take into account the proper selection for vigor and stamina as well as for type and color. See chart.

"This chart is a rule, so to speak, inflexible in its main thought, yet in part subject to change as the common sense of the breeder dictates. Remember there are no cast iron rules in poultry breeding in any of its phases.

"In beginning line breeding with any breed or variety, start with birds that are the very best of their kind and that are as nearly alike in type as it is possible to procure with Standard color markings according to sex. To fix this rule in mind, I have drawn the sire and dam in the chart of the same type. Naturally one breeds to an ideal, but your breeding birds must also be ideal or as nearly ideal as a simple first instruction is to breed to an ideal from an ideal.

"As the breeding advances, the traits of both sires and dams being similar, family or strain characteristics are enhanced and a gain is made in Standard requirements in both sexes from one mating. (Ponder on this a while!)

"The male and female of the last mating are presumably unrelated. We prefer to have it thus in order to insure the highest degree of stamina and vigor. Among the progeny of the first mating there should be some males and females that are as good as the sire and dam. The second step, according to the chart,, is to select the most vigorous 1918 female with the highest desired qualifications and mate her back to her sire in1919, selecting at the same time, with the same care, the best 1918 cockerel and mate him back to his dam. This starts two inbreeding lines on the road toward purity breeding or line breeding. The resultant 1919 progeny contains three-fourths of the blood of the sire in one line and three-fourths of that of the dam in the other line.

"The third step shows the union of the best 1919 or three-fourths pullet mated in 1920 to her sire, who is also her grandsire, and in the other line you should mate the best 1919 son to his dam, who is also his granddam.

"The result of these two matings is to give us young on the sire's side that contained seven-eighths of his blood and one-eighth of the original dam's blood and in the dam's line we have young containing seven-eighths of her blood and one-eighth of the original sire's blood. This completes the first cycle of inbreeding, which should never go beyond the three-year limit with the original sire and dam in order to protect and preserve vigor in our lines.

"In 1921 we start the first year of the very best (nearest ideal) cockerel of the dam line, which should be mated to the highest quality pullet in the sire line, and they represent the new foundation of the second cycle of inbreeding which should be followed in exactly the same way as the first cycle until the second cycle is completed, which in all will take six years. By that time all traits that are incompatible with the requirements of the Standard will be eradicated and breed or family traits wholly its own will be permanently established.

"All this brings our breeding to the point where line breeding starts. Note on the chart that a cock from the 1919 mating in the first cycle is mated to a pullet of the last or 1923 mating in the second cycle. The 1919 cock is chosen because of his vigor and because he is far removed in relationship from the pullet of 1923. Such a mating conserves vigor almost as much as intelligent out-breeding, yet relieves us from any danger from the infusion of new or unrelated blood. This is line breeding."

DON'T BE CONFUSED

Many amateur poultry raisers become confused over the discussion of Mendel's Law, Felch's Breeding Chart, Card's Chart of Breeding and other methods recommended for breeding and line breeding. Mendel's Law and Felch's Chart are really only of value to a poultryman who is attempting to create a new breed or variety. Many of our students become confused and feel that they cannot make a success of poultry breeding unless they thoroughly understand Mendel's Law and the breeding charts which we have included in this book. They are included only for the purpose of giving our students general knowledge of these problems. In creating a new variety or breed, it would be absolutely necessary for you to follow some such system, but after a breed or variety is once created, you can make progress only by selection—constant and rigid selection year after year.

Select birds that have the shape you desire; birds that are marked and colored according to the Standard of Perfection; birds that have size, health and vigor; birds that perform and produce as well as win in the show room. If you will select your ideal specimens with the above requirements in mind, and will breed from such specimens year after year, that are not too closely related and yet may be line bred, your efforts are much more certain of being rewarded with satisfactory results than they would be if you confused your breeding system by attempting to follow Mendel's Law, Felch's, Card's or any one else's breeding chart. Selection, and continual selection, from the time the egg is put in the incubator until the bird is mature and leaves your farm, is a much better rule for you to follow than to allow yourself to be confused by attempting to fathom Mendel's Law.

WHAT IS MEANT BY OUT-CROSSING

By out-crossing we mean the mating of females, that have been inbred or line bred, with a male of the same variety that is in no way related to the female. This often results in increased vigor, increased size, increased flesh forming qualities, increased egg production, increased fertility and increase in length of life. Out-crosses should be made with great care. It is best to try the male with only a few of your females and see if the blood and the breeding of the male dovetails or mingles properly with that of the females for best results. When you discover such an out-cross that is successful, it will pay you to retain the sire as long as his usefulness lasts.

METHODS OF MATING

There are in common usage at the present time two methods or kinds of mating. The first is called *Single Mating*, and the other is *Double Mating*.

Single Mating. The single system of mating means the mating of a single breeding pen for the production of both pullets and cockerels which will meet the requirements of the American Standard of Perfection. This is the original and natural way of mating. It can, however, be successfully done only when Nature's requirements and the requirements of the Standard are identical. Dame Nature seems to have very set ideas of her own with regard to the proper markings of the male and female of the same variety, and mere man cannot easily set them at naught. In single mating both male and female that meet Standard requirements are selected, just as closely as possible, care being taken to have the male strong in sections where the females are weak, and vice versa. The one mating produces both male and female of Standard quality. This is called Style Mating.

Double Mating. The plan of double mating is of comparatively recent origin. As the name indicates, it consists in mating one pen for the production of males and another for the production of females, both of which will meet standard requirements. The practice was rendered necessary by the adoption of standards for certain varieties in which the color markings are contrary to Nature. This point was well illustrated by Judge W. H. Card in an address before the American Poultry Association. We quote as follows:

"One breed in our Standard will always be a double mating breed, and I, for one, would not like to see them otherwise. I refer to the Brown Leghorns. No handsomer male fowl walks the earth than a Standard Brown Leghorn cock. The same can be said of the female Brown Leghorn. Yet these two cannot be mated together for best results. Mated to their rightful consorts, however, they will reproduce themselves; i. e., the female, daughters like herself; the male, sons like himself. One fact must ever remain so long as the Standard is as it is for Brown Leghorns. That is, that the male Brown Leghorn belongs to the penciled breeds, and the female Brown Leghorn belongs to the stippled breeds. Delve into breed history and we find that the males of all stippled breeds have black breasts and bodies the same as the males of all penciled breeds, but there ends the similarity. All penciled breeds have males with black stripe in hackle and saddle. All stippled breeds have males devoid of black stripe in hackle and saddle, or with but a faint suggestion of it. The Brown Leghorn male has a strong black stripe in saddle and hackle. His sisters and dam are not stippled, but have prominent irregular penciling over the entire body. The Standard Brown Leghorn female is finely stippled like unto pepper dust. Her brothers and sire have no black stripe in saddle or hackle, or with just a faint suggestion of same. Penciled varieties embrace Partridge Cochins, Rocks and Wyandottes, and Penciled Wyandottes and Rocks. Stippled varieties embrace Black Crested Red, Golden and Silver Duckwing, Exhibition Games and Game Bantams, and Silver Gray Dorkings."

Another of the pari-colored varieties in which double mating is commonly resorted to is the Barred Plymouth Rock. This is due to the fact that the Standard calls for male and female in this variety to be the same color, while there is a strong natural tendency for the males to run light in color, and the females to run dark. In order to counteract these tendencies, to secure exhibition males, dark females are mated to an exhibition colored,

distinctly barred male. To produce exhibition females, exhibition colored females are mated to a male so light in color as to be of no value for exhibition purposes, but at the same time he must be distinctly and evenly barred.

Double mating is sometimes resorted to with solid colored varieties for the production of certain characteristics aside from color. For instance, the Standard for Single Comb White Leghorns requires the male bird to have an erect comb, while the female of this variety must have a nicely lopped comb. In order to more quickly and surely obtain these characteristics, a male bird having as nearly a perfect a comb as possible is mated with females having erect combs, or nearly so,—to obtain cockerels with straight, erect combs. To obtain pullets with the much desired lopped-over combs, a male bird with a lopped comb is mated to females with Standard combs.

To successfully practice double mating requires much skill born of long study and practice. To the true fancier it is the most fascinating work in the world.

We discourage double mating in any variety except where it is absolutely necessary to produce Standard exhibition birds. Double mating requires just double the houses, double the yarding, double the equipment to produce a given number of exhibition birds, as that which is required in varieties which may be produced by single mating. We have a man-made Standard of Perfection, and so long as they make requirements for certain varieties, which are contrary to Nature's laws, just so long will we have to practice double mating of certain varieties in order to produce exhibition males and females. In all double matings, the females in the cockerel line or cockerel matings are useless as exhibition birds and can only be sold for breeders or for market. For example, a pullet-bred Barred Rock cockerel mated to a cockerel-bred pullet of the same variety, would produce birds but little better than mongrels. The same would be true with a cockerel bred Barred Rock cockerel mated to a pullet-bred pullet of this variety. We, therefore, discourage any attempt to double mate any variety that is not absolutely necessary in order to breed exhibition specimens.

THE SUPREMACY OF THE PURE-BRED FOWL

From the jungle fowl of antiquity to the highly-developed Standard-bred fowl of today, marks an era of progress which has required years and generations of careful selection and breeding. Whereas, the jungle fowl hen laid less than three dozen eggs per year, the modern pure-bred hen that lays two hundred and more eggs a year is no longer rare. Two hundred pure-bred hens at the American Poultry School laid from two hundred to three hundred and four each.

We are told on good authority that the average farm hen lays in the neighborhood of seventy-five to eighty eggs per year, or a little more than twice the yearly production of the ancient jungle fowl. The average farm hen, sad to relate, is a scrub or mongrel hen, but a step removed from the jungle fowl, and not nearly as handsome. That she lays more eggs than her progenitor is probably due to the fact that she lives under more favorable circumstances, and has at least a trace of pure blood in her veins.

From the above, the reader may have already surmised that I have a deep personal grudge, of long standing, against every hen and her brother, who are unable to look the world squarely in the eye and proclaim vociferously that they are pure-bred Plymouth Rocks, or Wyandottes, or Leghorns or some other of the many excellent breeds of poultry. Like the Missouri mule, they are "without pride of ancestry," and, like him, they are "without hope of posterity."

If there is a single logical reason why a single scrub hen should be tolerated on a single farm in this broad land of ours, I have been unable to locate it. Take for instance the matter of egg production. One thousand, five hundred hens at the American Poultry School averaged one hundred and sixty eggs each or twice the average of the ordinary hen. These hens were all pure-bred, and represented twenty varieties, some of which are neither intended nor adapted for egg production. Yet the average

of all of them was twice that of the average farm hen. I consider it well within the bounds of reason to say that if all the hens in the United States were pure-bred, that fact alone, if neither the present methods of housing, nor care or management were improved upon, would add hundreds of millions of dollars a year to the income of the poultry raiser of this nation.

"What about crossing two pure-bred varieties in order to increase egg production?" I hear someone suggest. The fact that we have made such wonderful progress from the days of the jungle fowl to the present moment with our many varieties of pure-bred poultry, convinces me that proper methods and systems of selection and breeding of pure-bred poultry will equal and outstrip anything that will be possible with scrubs or cross

Defects in combs are very common. If a bird was exceptionally good in other ways, we would not refuse to use him in our breeding pen, even though he had a very defective comb. You should bear in mind at all times that the size and shape of the body, the vitality of the bird and its ability to produce eggs, and a bird of good shape and color, far outweigh any defect that it might have as far as comb is concerned. However, it is advisable to breed from birds as nearly perfect in comb shape as possible.

The head on the left shows a lopped comb. The comb perhaps was not broad enough at the base, and the beefy points lopped over. If a comb has strength enough at the base, the points will usually stand up, unless the comb is seriously defective. On the right is shown a comb that is far too beefy. The comb is also wrinkled and not properly proportioned on the head. We would, under no circumstances, breed from a bird with such a comb if we could avoid it.

breeds. Crossing two pure-bred varieties is the first step toward creating a mongrel. Take the second step, make the second cross, and continue, and—behold your scrub. Yet that is exactly what takes place in an overwhelming majority of cases, where the first cross is made. It is a practice which we are combating with all our energy, because it is costing our poultry raisers millions of dollars a year in profits.

From the standpoint of profitable egg production, pure-bred hens have another great advantage over their cross-bred half-sisters and scrub cousins, namely, that of uniformity of product. In selling eggs on a quality basis, a practice which is coming rapidly, a much higher price is paid for eggs which grade "first," and they must be large, fresh, naturally clean, AND UNIFORM IN SIZE, SHAPE AND COLOR. Eggs from cross breeds and mongrels are NOT uniform in size, shape or color, while those from pure-bred hens are more nearly so as a rule; nor, is nearly as large a proportion of them large enough to grade "firsts." In view of these facts, it would seem to be a logical conclusion that for profitable egg production, the pure-bred hen stands supreme.

Another argument commonly advanced as an excuse for crossing two varieties of pure-bred poultry is that the crossing increases the constitutional vigor of the progeny; in other words, that pure-bred poultry is deficient in constitutional vigor. The cause usually assigned for this deficiency in constitutional vigor is that breeders, in their efforts to breed their birds to the Standard requirements of shape and color markings, have resorted to the practice of in-and-in breeding to such an extent as to materially impair the constitutional vigor of the offspring. While this may be true, and doubtless is in certain strains of the various varieties, it is widely aside the mark to lay it down as a general rule. Scores of breeders of the various varieties are breeding strains as strong in constitutional vigor as could possibly be desired. If one wishes to increase the constitutional vigor of his flock, he can introduce new blood of the same variety which is no more related to his birds than though it were blood of another variety.

Even if cross breeding did increase egg production or did increase vitality, it would still be necessary for some one to breed pure-bred poultry, or else we could do no cross breeding. You have to have your pure breeds before you can get your cross breeds. If you are going to encourage cross breeding and discourage pure breeding, then from whence will the fowls come to do your cross breeding? Let's not drift to the days of the razor-back hog, the only horned Texas cow, and the dunghill hen. Let's stay by and encourage the Berkshire and the Poland China, the Jersey and the Hereford, and the pure-bred hen.

The whole idea of crossing two varieties to increase constitutional vigor, is based on a fallacy. If I mate a bird whose constitutional vigor is forty per cent perfect with one whose constitutional vigor is eighty per cent perfect, part of the chicks will have the forty per cent constitutional vigor of one parent, part of them will have eighty per cent constitutional vigor of the other parent, but more of them will have sixty per cent, or the average, of the constitutional vigor of the two parents, REGARDLESS OF WHETHER THE TWO PARENTS REPRESENT THE SAME OR DIFFERENT VARIETIES. If, as is argued, the pure-bred varieties are deficient in constitutional vigor, there is absolutely nothing to be gained in crossing them. I have seen just as many chicks of poor vitality in mongrel flocks as I have in pure-bred flocks. Haven't you? I have seen just as many chicks of low vitality in cross-bred flocks as I have in pure-bred flocks? Haven't you?

Occasionally someone advances the argument that crossing the pure-bred varieties produces a better market fowl. In order to ascertain the feeling of those who are in closest touch with the market poultry business in this regard, we, last spring, mailed out two hundred and fifty letters to as many poultry buyers scattered throughout the state (men who buy millions of dollars' worth of market poultry every year), asking them which they preferred, mongrel chickens, cross breeds, or pure breeds, for market purposes. The replies came back unanimously in favor of the pure breeds. In fact there is so great a difference in the quality that many of these buyers are going to offer a premium of from two to four cents per pound on pure-bred poultry, in addition to the current quotations, during the coming season. They claim that they can sell the pure-bred poultry on the city market for enough to warrant them in offering the farmers extra inducements to produce that kind. They claim pure breeds fatten easier and dress up much nicer. These men know. There is no sentiment with them. It is a matter of cold dollars and cents. Their verdict should be taken as final, and we seem to be justified in drawing the conclusion that for market purposes the pure-bred fowl is supreme.

Read their opinions:

"We are perhaps handling more poultry than any other one concern in the state, and we desire to put ourselves on record as being emphatically against what is commonly known as scrub poultry, and as being in favor of pure-bred poultry."—Murry & Schmidt Produce Company, Sedalia.

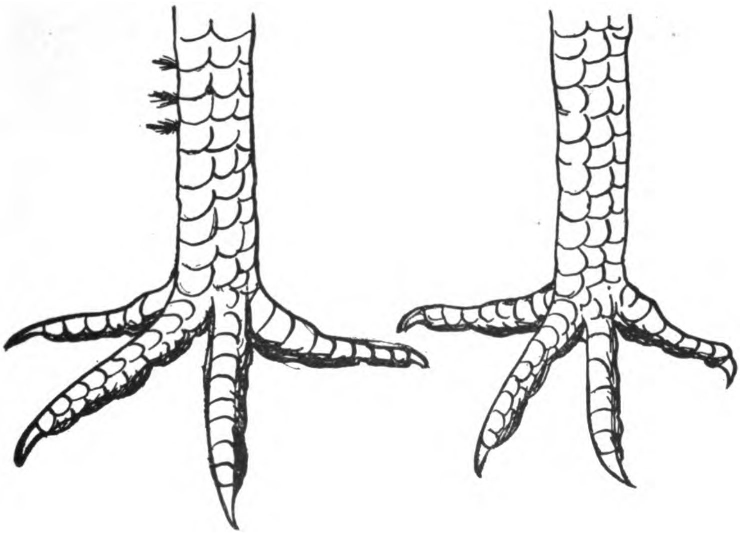
"Pure-bred stock of the heavy weights are worth more and are much more perfect than the cross breeds. Even if it were possible for the scrub to weigh as much as the pure-bred, they do not have the character or quality to command the best prices."—F. M. Stamper Company, Moberly.

"We intend to pay 2 cents per pound less for scrubby stock this year than for good grade, pure-bred. We will make a heavy discount for small, scrubby stock."—Selby Produce Company, Kirksville.

"Anyone who says there is no difference as to the kind of poultry, pure breeds or scrubs, has certainly had very little experience in the live poultry business, and none whatever in the dressed poultry buusiness."—Carpenter & Shafer Company, Butler.

"Anyone who has had any experience in dressing poultry and handling their eggs knows that you get a better pack and larger eggs from well-bred stock than from scrubs. One spring we gave away pure-bred roosters to encourage them along this line."—Savannah Produce Company, Savannah.

These same dealers in poultry and eggs state that it is also true that careless and indiscriminate methods of housing, feeding, and care of poultry in practically every case leads to or is followed by indiscriminate and careless methods of marketing eggs. They state that it is a noticeable fact that, as a rule, those farmers who have cross breeds and scrub poultry also have scrub houses, and the poultry does not get much care and attention, and



On the left is shown the shank of a bird which has three small stubs growing out from beneath the scales of the leg. These stubby feathers would disqualify any clean-legged variety, or should there be found a little down or stub between the toes, this would also disqualify the specimen. It is not wise to breed from a bird that shows defects of this sort. The leg on the right is free from this defect.

the eggs are marketed in much poorer condition than the man who has pure-bred poultry. As a rule, the farmer who has pure-bred poultry feels a pride in his fowls, houses them well, feeds them properly, and takes a pride in marketing clean, fresh eggs of high quality. These facts alone should induce us to encourage pure-bred poultry (not especially fancy poultry), and to discourage the breeding of scrub and cross breeds.

The raising of pure-bred poultry, then, is not only justifiable, but it is an economic necessity, regardless of whether one is in the business for the production of market eggs, or market poultry, or both. But there is another viewpoint which we have not yet mentioned, a position in which the pure breeds are alone and, therefore, supreme. I refer to the tremendous industry which has been developed, during recent years, in eggs for hatching, baby chicks, and birds for exhibition and breeding purposes. In this branch of the industry there is a constant and increasing demand for good, strong, healthy, vigorous stock, bred and selected with a special view to improving the utility qualities. The net profits in a trade of this sort are

greater than in any other branch of the industry. Yet the person who, "because Father did," continues to raise scrub or cross breeds, is shut out from this profitable end of the business. Surely such a one must be short-sighted indeed.

By breeding only pure-bred poultry a farmer has eight avenues, or outlets, for the sale of stock and eggs and for business, where with cross-breeds or scrubs, he only has three outlets. The man who keeps a good breed of poultry can not only sell eggs and stock on market, but he can also sell a few settings of eggs for hatching purposes, baby chicks for breeders—young stock for market and for breeders, or some few of the best for show purposes. With cross bred poultry, all you can offer for sale is eggs for food and old and young stock for market. It costs no more to feed a good chicken than it does a dunghill. You can get a great deal more pleasure out of them, a great deal more profit, and after you once get a start it costs no more to produce good poultry than it does a common scrub.

Last, but by no means least, there is the aesthetic side, the beauty side, of the supremacy of pure-bred poultry. To the true lover of Nature, the true fancier, this side overbalances all else. To understand Nature's laws and the proper use of them, to bring new creations of beauty and symmetry into the world, is one of the rare joys of living. What can be more beautiful than a flock of pure-bred poultry, uniform in size, shape and color, dotting the green sward on a bright spring day? And when one stops to consider that there is more cold cash in rasing that kind, surely 'tis enough to convert the most hard hearted!

"A man paints on canvass the image of a Perfect Thing, and the world calls him an Artist. The sculptor may chisel from cold marble a thing of perfect form, and he is written in history as a Master. But the painter and sculptor, at their best, produce but dead symbols. They are mere heralds of beauty that exists in Nature or in the refined imagination. What title shall fall to the lot of the man who delves into the hidden secrets of Life itself, masters the laws of Reproduction and effects, in Flesh and Bone, a perfect Creature,—a beautiful hen? Is not he who accomplishes a perfect Living Thing as truly a patron of Art as a creator of inanimate images?

WHICH VARIETY SHALL I USE

The question of egg production is not a question of breeds. Any of the breeds and varieties in general use at this time can be so selected and bred that the result will be entirely satisfactory. The whole problem is the problem of selection and breeding. Then why be jumping from one variety to another? Make certain at the very beginning that you have the variety that suits you best as to shape and color. Attend some good sized poultry show and look the varieties over and satisfy yourself before you start with a variety. Then stay with it and study to improve it.

HOW MANY VARIETIES SHALL I KEEP

One variety, properly handled, is enough for any man or any farm. We know of a man who recently failed because he started with twenty different varieties. He said he thought he would try them all out and then determine which he liked best, but it took so much housing, so much extra labor, so much extra fencing and extra expense to keep all these varieties separated that it took all the funds he had before he really got fairly started. With one-tenth the labor, houses, fencing and expense, this man could have actually raised more poultry and succeeded, whereas he failed in one short year. By having one variety you can do away with most of your fencing and, thereby, give more free range and thus raise your poultry under more natural conditions. This will insure better health and greater net profits. Confine your efforts to one variety and you will come nearer to succeeding.

MATING THE BREEDING PENS

Here is where your success or failure for one year, or many years in some cases, or for perhaps all time to come, may depend. A large per cent of the poor hatches, the mortality among the young stock, the general tendency to disease, and defects in shape and color of your stoock are traceable

to mistakes made in the breeding. The lack of constitutional vigor, immature pullets and cockerels, reckless inbreeding, lack of exercise, forced egg production, overcrowding, and unsanitary surroundings are responsible for much of our troubles and are the most common errors.

The stock should be mated for two weeks or a month before you expect to hatch their eggs. The eggs can be safely incubated after five days if no other male has been with the females. If another male has been with the hens and they were laying at the time, it will be from two to four weeks before you can set the eggs and depend upon the chicks being sired by the second male.

In pens of Leghorns we usually use one male with ten to fifteen females. In mating Plymouth Rocks, Reds, Wyandottes and Orpingtons we

Birds of low and high vitality.—These two pictures have never been retouched. On the right is a White Plymouth Rock of high vitality and a good specimen to breed from. On the left is one of low vitality. You would breed weakness and susceptibility to disease by using such a male at the head of the breeding pen.

use one male with ten females. Langshans, Cochins and Brahmas should be mated one male to eight females. If any of these varieties are on free range you can use one male to twice the above number of females. It is often advisable for a poultryman who has much business and a great demand for hatching eggs to mate one or two hundred hens in the general flock with a number of males and sell eggs at a reduced price from this general mating. But his choicest matings should be made in separate breeding pens.

VIGOR LIES AT THE FOUNDATION

Of all things which might be said or written on breeding, the most important and that which furnishes a foundation upon which to build is VIGOR—CONSTITUTIONAL VIGOR. Whatever else you may do, do not make the mistake of using birds that are immature, or lacking in that all important virtue—VIGOR. See that your breeding stock is robust and active. It should be broad between the legs, and show every appearance of good health. Never attempt to raise poultry until you can readily distinguish the difference between a healthy, vigorous bird and one that is not. Never allow your anxiety for shape, color or eggs to tempt you to breed from any bird that is not the very picture of vigor.

VIGOROUS SELECTION IMPORTANT

The breeding of high class poultry permits of rapid variations being made for better or for worse. Unless the breeder carefully selects and vig-

orously culls his breeding stock, in order to keep up the quality to the highest degree, the stock is certain to begin to show signs of deteriorating very rapidly. But this same tendency to quick variation permits the poultryman to make rapid improvement along the lines of both beauty and egg production, if he applies himself and intelligently directs and controls his matings from year to year. This fact permits a breeder to begin with moderate priced stock and improve it to meet his requirements.

SHOULD WE CHANGE MALES EACH SEASON

Most assuredly not. Each time you introduce new blood you introduce new characters. The continual introduction of new characters makes uniformity in a flock impossible. Besides, if you practice changing males each season, you cannot afford to pay the price of good males for only one season's use, and you are forced to buy low priced males and, therefore, get the culls from the breeder's yard.

Instead of buying from five to ten males at $1 each to go with a flock of 100 hens, buy one male at $5 or $10 and get a little better bird and mate him with your ten or twelve choicest females. This insures you the very best reslts from your breeders, and also enables you to sell infertile eggs from the general flock.

A very good plan of getting the maximum amount of good from one male is by inbreeding to some extent unless bad results follow.

Instead of buying a low priced cockerel, pay enough to get a first-class bird—one that has some genuine merit, and that wil stamp his individuality on your flock. Mate him to a few of your best pullets; instead of selling him and breaking up the pen at the end of the seasson, continue to mate him to the same females for at yeast two years more, and longer if a sufficient number survive. The cockerels from this pen are to be used for each year's mating in the general flock, being disposed of at the end of the breeding season. In this way, without making any but remote relationship matings, the qualities of this high-grade male may be thoroughly fixed in the entire flock. After the third year, purchase another superior-quality male and if the first year's mating proves to "nick" with your flock, use the cockerels as above described and continue this plan indefinitely, bringing about a permanent improvement in the flock at small expense and with no danger of injurious inbreeding, even when practiced by the most inexperienced."

QUESTIONS ON THE PRINCIPLES OF MATING AND BREEDING
LESSON NO. 8

1. Why is the science of poultry breeding a complex one to teach, or to put into practice with any degree of certainty?

2. What is meant by heredity? What is meant by atavism?

3. What should be the practice of any breeder in dealing with these undesirable traits which crop out in his variety?

4. What has environment to do with the improvement of any breed or variety?

5. In the breeding of poultry and in the study of Mendel's Law, what is meant by dominant characters? By recessive characters?

6. What is inbreeding, and briefly define line breeding, and what is the purpose of these methods?

7. Why is it necessary to use rigid care in selection when line breeding?

8. What is meant by out-crossing and what are the benefits of same?

9. Why should we try to discourage double mating as much as possible?

10. Is it necessary to cross breed different varieties to maintain constitutional vigor or should we keep pure-bred fowls?

BREEDING FOR EGG PRODUCTION

No question connected with poultry is of any more importance than this. More than half the profits derived from poultry comes from market eggs and from eggs for breeding purposes. The important questions which have any bearing on this vital question deserve your most serious consideration.

WHY DOES A HEN LAY, AND THE EXTENT OF HER POSSIBILITIES

Hens do not lay for the pleasure of it, neither do they lay for the purpose of increasing our bank account. Anyone who has noticed a hen on the nest in the act of laying, who has seen her as she stood there straining to discharge an egg, or who has seen these eggs blood stained from some internal hemorrhage, must realize that the hen does not lay for the amusement of the thing.

Every living thing desires to reproduce its kind. Some of the lower orders sacrifice their lives in order that they may propagate their kind. Man has selected and bred and stimulated this instinct in the hen until she produces from twenty to fifty times what the original of her kind did.

The day a chick leaves the shell, it is endowed with all the yolks, or ova, or eggs, that it can ever lay, and several thousand more. Nearly every chick's body possesses several thousand of these tiny yolks and it is possible to count as many as several thousand in practically every pullet. No amount of feeding, no system of housing, no method of care and management, however good it may be, will add one more yolk to the number already provided by nature. The method of breeding, feeding, housing and care, determines largely the number of tiny yolks which any hen will be able to ripen or develop into full-sized yolks and manufacture into the finished product.

Breeding has more influence over this than any other one thing, but don't ever get the idea that you feed a hen to feed yolks and eggs into her body. You feed her for the purpose of enabling her to develop the yolks which nature and breeding have already provided and made possible.

Man has taken the jungle fowl, which only laid a few eggs per year but was of longer life than our domestic fowl of today, and he has bred and improved the wild fowl until we now have hens laying 300 eggs in a year and 1,000 eggs in a lifetime of only a few years. Nature never intended that any hen lay 200 or 300 eggs in a year; and, by increasing production to many times what the wild fowl laid annually, man has shortened the life and, in most cases, has decreased the vitailty from that of the original fowl. Modern methods have not only increased the production of a lifetime, but we are also forcing the over-worked hen to deliver her 15 or 20 years' supply in two or three years, as a rule.

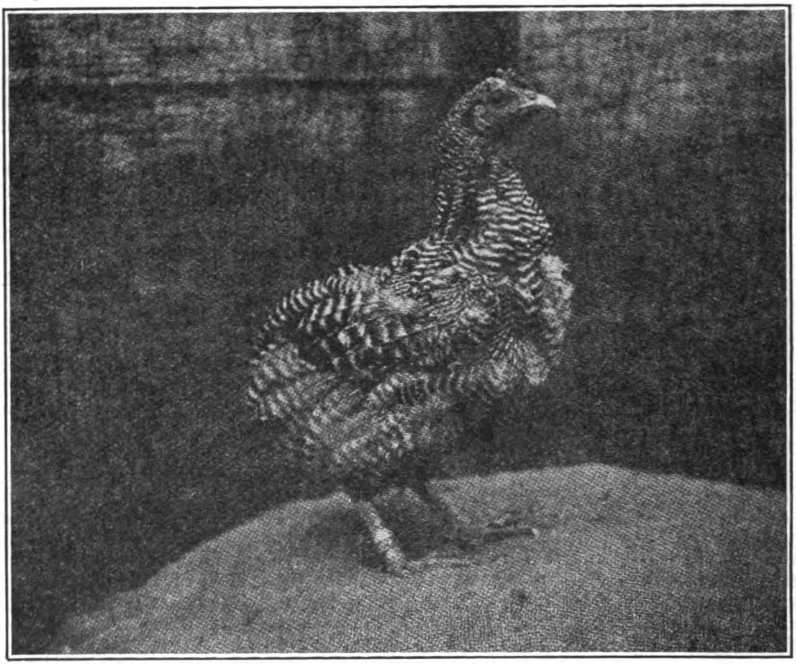
CAN EGGS AND BEAUTY BE COMBINED IN THE SAME HEN

Can utility and beauty be combined in the same fowl, or, in other words, is it possible to combine egg production and Standard requirements? if not, we had better change the Standard where necessary. It is said that the life of the average fancier is three years. If this be true it is our duty to get busy and help him develop ways and means by which he will be enabled to make more dollars and cents and thus stay longer in the business which he has chosen and in which we are all pleased to have him engage.

Some are still arguing the momentous question of "Which was created first, the hen or the egg?" and, also, that perplexing question of "Why a black hen lays a white egg." Could they not better spend their time trying to produce the hen and to get the egg? We also see many arguing for and against the question of combining "utility and beauty." Instead of saying it cannot be done, had we not better be trying to harmonize and combine these two desirable qualities? We all admit that they are desirable, so let's quit trying to discourage those who are making the effort, and find out on what basis or to what extent and to what degree they may be combined.

A hen that never laid an egg would naturally be expected to score some higher than a hen of the same variety that laid a great many eggs, but we

would rather have a hen that scored 90 and laid 200 eggs than to have one scoring 94 that laid only 90 eggs. The man who would attempt to discourage the breeders from making an attempt to combine these two qualities, in all varieties of poultry, is either prejudiced or narrow minded. The Standard of Perfection calls for 100 points for every variety. No one ever saw a bird or perhaps ever will see one that is perfect or would score 100 points. But that is no reason why we should discourage breeders in their efforts to breed more perfect specimens. It is just as sensible to do that, however, as it is to try to tell them that they cannot combine utility and beauty to a greater degree than they are found in the average flock at the present time. The thing to do is to make the effort and quit arguing about it. We are convinced that it can be done. If it cannot be, then it is high time we begin



Barred Plymouth Rock Hen No. 566 laid 254 eggs in twelve months. A hen of good shape and well marked. Beauty, good color, and egg laying ability were combined in this hen. This was taken on December 1, when she was in full moult.

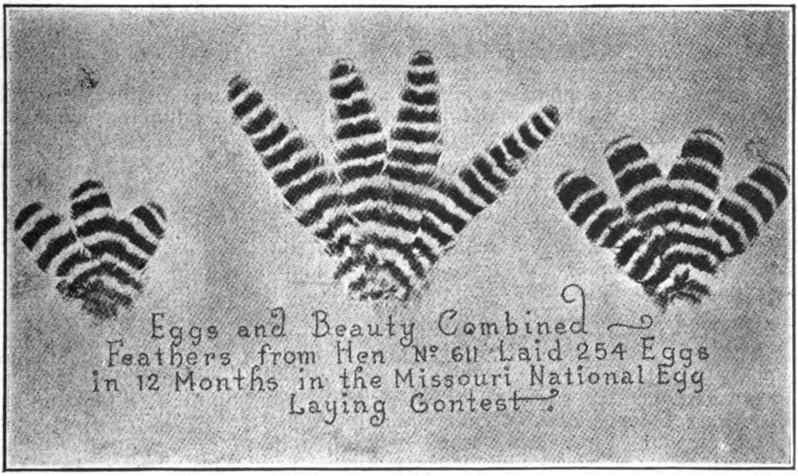
to discover the changes it is necessary to make in the Standard requirements so that it may be done.

A prominent breeder of Buff Leghorns had first prize winners at the World's Fair at San Francisco, and at the Chicago Poultry Show hatched from birds with records as high as 215 eggs. Prominent Barred Rock breeders, to our knowledge, have had hens lay as many as 250 eggs and still score high enough to win first prizes in strong competition. If this can be done with these two varieties, it can be done with most any other. There is no use to put goggles on our eyes and blind ourselves to the truth; the thing to do is to get busy and turn the trick. The breeders who are making the effort are those who are going to stay in the business when he who hesitates will long be forgotten.

The time to score a pullet is just before she has laid her first egg. It has been long admitted by all fanciers that this is the period in the life of the average female when she is considered in "full bloom." This is when you can get the best check on her from a fancy or Standard point of

view. After she has been trap-nested and gone through a hard year's work and the strain of laying a large number of eggs, it is not to be expected that she will retain quite the same beauty of plumage and shape that she had just previous to laying her first egg. But her value and true worth from a fancy standpoint and for breeding purposes may be there just the same. A certain lady may be considered the most beautiful woman in your community, but after that lady has spent a hard day's work in a hot kitchen she may come out with flour and smut on her face and clothing and not look quite as attractive as she does in her evening clothes with her drug store complexion, but the natural beauty and good qualities of the real woman will be there just the same, though they may be temporarily hidden by flour and smut from the pots and kettles.

Beyond a doubt in my mind, a reasonable amount of beauty and a reasonable number of eggs can be combined in the same fowl. The Barred Rock, the White Rock, the Buff Leghorn and a number of the other hens which made the highest records in the American Egg Laying Contests, were hens which would not disgrace any show room. The Barred Rock which laid 254 eggs was exceptionally good in colcr and shape. Just as have some of the fanciers utterly disregarded egg production in their matings,



so have some of the egg men utterly disregarded color in their matings. We do not believe it is possible to produce a record-breaking layer and pay too much attention to color, neither can you breed the exceptionally high scoring specimen and pay too much attention to egg production, but we do believe it is possible to breed whole flocks that can average from 150 to 180 eggs, and have individuals laying from 200 to 250 eggs, and still have beautiful color and shape, which is not necessarily Stndard shape. There seems to be a disposition to gradually change the shape of our varieties until they conform more nearly to the egg type, and that is what we should come to. Also the egg men should strive to improve the color in their flocks, and the Standard makers should always bear in mind not to make the color requirements so artificially impossible that a good poultryman could not combine a reasonable amount of beauty in shape and color, and at the same time have a productive flock. We are glad to say that the disposition of the Standard makers seems to be in that direction more than ever before.

It does not mean that you have to entirely disrgard shape and color to breed a good laying strain of any variety. We know of cases where some of the highest scoring pullets and some of those which won the highest honors in the show room of certain varieties, were also those which laid the greatest number of eggs. These pens were fine in color and shape as well as to lead when it came to the egg basket. Of course, we all know that after a pullet or hen has laid a large number of eggs, it tells on her ap-

pearance for the time being, at least, but that does not necessarily mean that these birds will never again be in show condition, or that their progeny will not be birds good enough to go into the show room. We are quite certain of one thing, i. e., it is not necessary to breed a flock of mongrels for them to prove to be satisfactory layers.

If you are seeking improvement in any single quality, color, shape, or eggs, the desired result is comparatively easy to obtain. The energies of the system can be made to act quite readily if development is sought only in any one of these directions. Sometimes we obtain phenomenal development in one line at the sacrifice of the other qualities, and oftentimes at the sacrifice of the future usefulness of the fowl. However, the fact remains that high attainment can be obtained in any one or all three of these qualities, color, shape and eggs, without any one of them necessarily being seriously antagonistic to the other.

"Admitting, therefore, that it is a more difficult task to breed for a combination of Standard quality and utility values, it is erroneous to suppose that it can not be done. It is being done by breeders, and each breeder should give careful thought to the opportunity which exists for the man who can succeed along these lines. The breeder who is successful in producing a strain of birds capable of good production has a promising market among the so-called breeders of utility fowls. If he is successful in combining with this production Standard qualities, so that he can produce birds capable of winning in the poultry exhibitions of the country, he has a very profitable outlet in the sale of breeding stock to those who are interested in exhibitions of that kind. The man who breeds only for Standard qualities or the man who breeds only for utility value has a much narrower outlet for his stock and one which will prove to be very much less profitable.

"The fact should not be overlooked that the man who breeds for Standard requirements and therefore for beauty in his fowls has something which the casual observer can see and appreciate, and has in his fowls a quality which will sell breeding stock. If he has only egg production to commend his stock he must tell the purchaser about it, for there is little or nothing which the prospective buyer can see in the birds themselves to indicate to him whether the strain is a good producing one.

RESULTS AT THE GOVERNMENT FARM

"As an example of what can be done in the way of combining Standard and utility qualities in fowls, the work which has been carried on at the Government Poultry Farm at Beltsville, Md., may be cited. While the work done there is experimental in character, in augurating it, it was decided to use for the experimental work only birds of as good quality as could be obtained in this country. As a result of this start and the subsequent maintenance of quality it has happened that many of the birds which have proved to be good producers have also proved to be of most excellent quality.

Just as this has occurred at the Government farm, so it will occur in the hands of any capable breeder who is working with good stock. In the matings of the birds at the Government farm this spring, male after male is being used which would be a credit to any breeder, and which would do well at any poultry show held in the country. Not only have these males this good quality so far as the Standard requirements are concerned, but they are from hens of 200-egg production or better, and in many cases 200-egg production appears in their pedigrees to a considerable extent in addition to the records of their mothers."

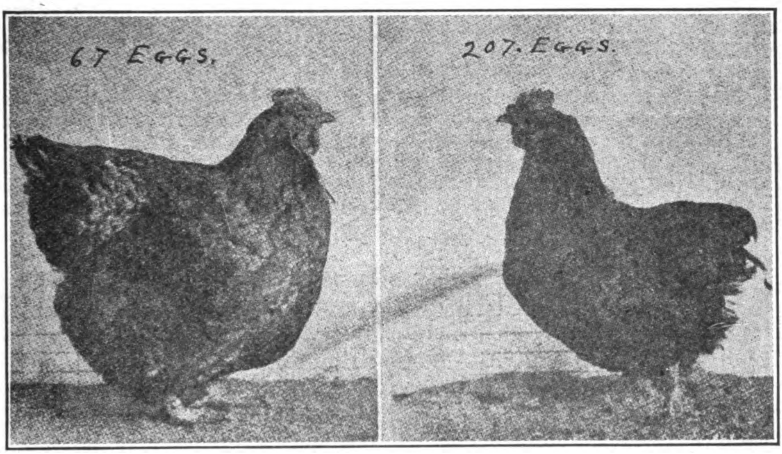
STRAIN MEANS MORE THAN VARIETY

A "strain" in poultry simply means a family of any variety. There are good hens and poor hens, good strains, or families, and poor strains in all varieties. Of the most popular varieties, one is about as good as another. There are good and bad strains, however, of all varieties.

A poultryman may carefully select and breed his birds along certain lines for years, until he gets the desirable qualities so firmly fixed in his flock that no matter whose hands they fall into, on either this side or the other side of the ocean, they give about the same results, providing they have reasonable care.

It is a noticeable fact that pens from the same breeding maintain about

the same average egg production, whether the pen is in Leavenworth, Storrs, Philadelphia, or Mountain Grove, and all their methods of housing and feeding are entirely different. The breeding back of the birds makes them maintain about the same rate of production, no matter where they are being tried out. This holds true with both good and bad pens. A few years ago, when I mentioned "strain" and "breeding" and "selection" as the foundation of a flock of high egg producers, some "authorities" made light of such "nonsense." They claimed that you could take most any old fowl and by giving it the right feed and care, you could get equally as good results as the breeders who were leading in the egg laying contests. That is, they said there was nothing to "strain" and that "breeding" was not the secret of egg production. Of course, we know that without the proper feed and care, a hen will not lay many eggs no matter what strain she is from or how good her breeding may be. But when a breeder can make a consistent record in laying contests year after year and lead all competitors, we will have to admit that he has a superior laying strain. If Mr. A. has



STRAIN MEANS MORE THAN VARIETY

Here we have two Black Orpington hens, one of an egg strain and egg type, and the other of a beef strain and beef type, as you can plainly see. Both are Black Orpingtons, but came from different breeders, different strains and different families of Black Orpingtons. As far as egg production is concerned, there is often more differences in strains or families of the same variety than there is difference in many of the breeds and varieties themselves. Careful selection and breeding establishes a strain. How careful we should be then to know something about the history, record and breeding behind our birds so that we may establish a good and profitable strain of our chosen variety.

a pen of Barred Plymouth Rocks which leads all other Plymouth Rocks year after year, and Mr. B. has a pen of Barred Plymouth Rocks which is at the foot each year for three years, we will have to admit that Mr. A. has a laying strain, and Mr. B. has a strain which are not good egg producers.

IS THERE A POSITIVE EGG TYPE

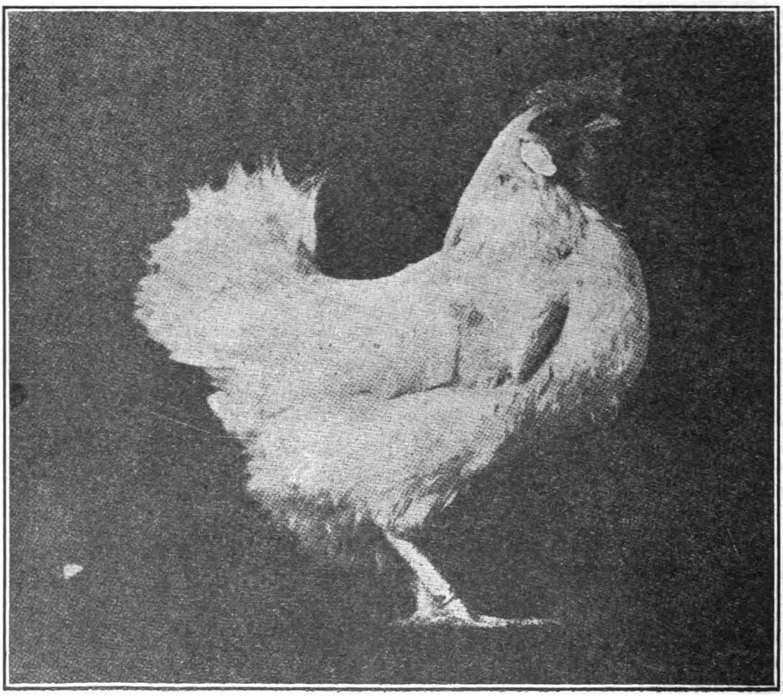
All signs sometimes fail, and there are exceptions to all rules, but we are of the opinion that there is a definite type in poultry which indicates productiveness the same as a good dairyman finds that certain characteristics and a certain conformation in cattle indicate the productiveness or non-productiveness of certain individuals. Among other things it is generally agreed that to be a good milker, a cow must be healthy and vigorous, she must have a big body or plenty of capacity, and she must have a large udder and large milk veins. The more we study the productiveness in poultry the more firmly we are convinced that the same general principles apply to the productive hen. There is an egg type in poultry and the

day will come, if it is not now at hand, when we can tell in a general way the good from the bad by certain and definite characteristics. Of course, in the dairy business the "Babcock test" is the final test of the quantity of butter fat, and just so with poultry, the trap-nest will perhaps always be the final test.

Mr. Tom Barron of Catforth, England, recently visited us and while here we had him visit several different yards and point out one or two good and bad hens in each yard. He did so and after he had left we looked up the records in each case and found that the hens which he claimed were of poor type and producers were among the poorest layers, as verified by our records. In one case we had a White Orpington which had not laid an egg and she was in a pen with eleven other hens. The hens were driven before him and at first glance he picked out this hen which was a blank as far as production was concerned. The hen was in good health and to the ordinary observer looked about like any of the others. He pointed out the good and bad in other pens without handling a single hen. The trap-nest record verified his statements.

We believe that any man, with reasonable intelligence, who studies the question of selection and breeding for egg production year after year, will get a certain and definite type firmly fixed in his mind, just as is true with the dairyman. What is this type? That is the question.

There is an egg type and a meat type in poultry, just as true as there is a dairy type and a beef type in cattle. We find both of these types in all varieties of poultry. And there is also the intermediate or dual purpose type. We are not going to attempt to describe these except to say that our best hens are medium sized birds and, as a rule, are a little under Standard weight. They are late moulters, and not too much inclined to broodiness. They have thin pelvic bones; rather high tails; rather narrow skulls, not a



A HEN OF TYPICAL EGG TYPE

Laid 273 eggs in the Missouri National Egg Laying Contest. She is high in front, large comb, prominent eye, large crop, long body, high tail, broad back, broad behind, thin pelvic bones, and full of vigor.

masculine head in appearance; large, bright eyes; large combs; long and broad backs, carried much higher than that portion nearest the tail; the deep bodies; wide behind with plenty of space between the point of their breast bone and the points of the pelvic bones; soft, loose, pliable skin, and they must be good feeders, always active and alert. The good laying hens are nearly always somewhat closely feathered, not loosely feathered like the Cochins. We believe that if a White Leghorn with a record of 250 eggs and a Barred Rock with the same record, were both in good health and condition, and were both killed and picked at the same time, you would find a great resemblance and uniformity in the shape and measurements of the body and bones of the two fowls. You would have to make due allowance for the extra size of the Plymouth Rock, of course. These are general characteristics as they are now found in high-laying hens, but we do not mean to say that high-laying hens can not be bred so as to to have a lower carriage of tail and other Standard requirements. But it will require careful selection and breeding to do this.

You should select and breed from hens and pullets which have been bred for egg production as well as to select males so bred. The males and females should be broad between the legs and stand up like a soldier. The Hogan System, sensibly applied, is the best test for type that we have ever used, and it stands next to the trap-nest itself.

BREED FROM WINTER LAYERS

A hen may not lay as many eggs as a certain other hen, but the first hen may far excell the second hen in net profit to the owner, because she laid the bulk of her eggs when the price of eggs was highest. We ought to use hens and pullets for breeders which have shown the ability to lay in fall and winter. We should endeavor to fix and try to perpetuate winter egg production as a family trait in our flock. Any old hen can lay in spring and summer when the grass is green, the sun shining, and the flowers blooming. In fact, they lay then only because they can't help it. But a hen that lays in winter, lays because she is bred that way and has the ability to lay in spite of adverse conditions. The males should also come from winter layers if we are to perpetuate this good quality in our flock. We don't mean that you must set the eggs after a pullet has laid heavily all winter, but we usually try our pullets in the fall or winter by the use of trap-nests or by some other method, and then give the pullets a rest just prior to the breeding season. A hen or pullet will never make a great egg record unless they lay a goodly number of eggs in fall and winter. Neither will they ever be very profitable if they lay them all in spring and summer. We advise breeding from stock which shows the ability to produce some eggs in winter months.

DO NOT SET THE FIRST HENS TO GO BROODY

A common error is made by practically all poultrymen, and especially with farmers who practice hatching eggs with hens instead of incubators. The poultryman is usually anxious to get out a few early chicks, and in his anxiety to do so, he sets the first hens which become broody. These are the hens and pullets which have laid all winter, and are those which prove the best layers, as a rule. The result is that the poultryman is then setting eggs from his drones that waited until the warm weather of spring to start laying, and he is incubating their eggs with his best winter layers. The result is that he is hatching eggs from the dead beats and drones, and is losing the use of his choicest breeding stock during the breeding season. Not much progress can be made in breeding for egg production by this method. You had better invest in 120-egg size incubator, or one which is larger and meets your demands, and keep the choicest hens to lay eggs to use for hatching.

DISPOSITION TO BROODINESS IS A HINDERANCE TO A HIGH EGG YIELD

If a hen becomes broody from six to ten times a year, as many of them do, there is not much opportunity for such hens laying many eggs, some of them not laying enough for their own keep. It usually takes the average person from two weeks to a month to break a hen from sitting and start

her to laying again unless you place her in a brood coop and break her immediately upon discovery of her inclination to broodiness. Some of our best laying hens go broody many times during the year, but are broken up at once. If a hen goes to sitting several times during the year, you can see there is not much chance for much of a record if she is allowed to spend much time sitting.

This being true, it is important that we breed this disposition out of the hens as far as possible. Some hens of all varieties never go broody, especially Leghorns. Then why is it not reasonable to suppose that we can breed this disposition out of all varieties to a greater or less extent? Quite a good many hens in even the supposed non-sitting varieties go broody. So we cannot hope to eliminate this entirely, for it is a part of the nature of a hen. But by setting eggs and breeding only from such hens as seldom if ever sit, we can in a few years eliminate much of this disposition from our flock. Also be careful never to use a male from a hen that spent most of her time and energy in sitting.

EARLY HATCHED AND EARLY MATURING STOCK IS BEST

The pullets and cockerels which mature early make the best breeders, when it comes to breeding for egg production. The early hatched chicks are those which are easiest raised. They are the most profitable because the pullets begin to lay in the fall and lay during the winter season when eggs are highest. Hatch at least a portion of your chicks early, and select the early maturing pullets and cockerels as your breeders for increased egg production. It is an indication of weakness and lack of proper breeding and often a lack of vitality, if the young stock is very slow to mature. Select for breeders only those which grow well and mature reasonably early, at least.

If Plymouth Rocks, Rhode Island Reds and the larger breeds are hatched in February, March and April and if Leghorns are hatched in April and May in the Central States, the pullets which mature and start laying well during the months of November, December and January will prove to be your highest producers and your best breeders, as a rule.

We know of many farms that never use the trap-nest and yet they have a flock which is far above the average, when it comes to egg production. The method which they use in selection and breeding is to use only the cockerels which show earliest development and they use the pullets which lay heaviest during the months of November, December and January.

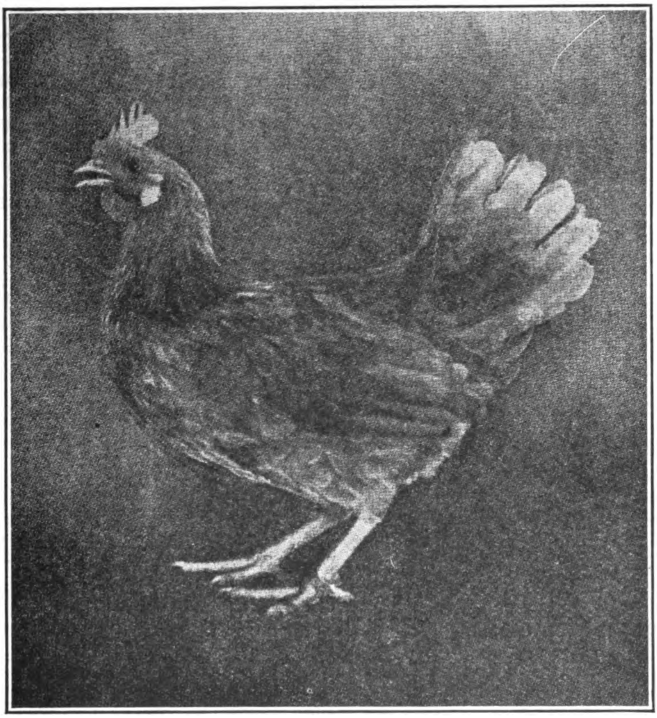
If you will follow this rule, year after year, you can make wonderful progress in breeding for egg production, even though you do not have a trap-nest at your command.

You will be obliged to depend upon the early hatched and early maturing pullets largely for your winter eggs. The yearling hens have been laying from eight to ten months and they reach autumn with their egg organs temporarily exhausted. They have yet to manufacture their winter coats. A hen has about 8,000 feathers on her body and it requires more food, more energy and a greater strain upon the constitution of a fowl to grow these feathers, and still survive with better health than any of us appreciate. A fowl must have a little rest just at this time, and we should not be disappointed because our hens do not lay every month in the year, any more than we should that our trees do not bear fruit every month in the year. We should depend upon the early hatched and early maturing pullets for our profitable egg production in the fall, and be content to give the hens a chance to rest and recuperate at that season.

In view of what has been said, we recommend, for the Central, Eastern, and Western States at least, that Brahmas, Cochins and Langshans be hatched as early as January to March; Plymouth Rocks, Wyandottes, Reds, and Orpingtons from February to April; and Leghorns not later than May. You will have to depend much upon incubators and brooders to some extent if you are to do much early hatching. On the Pacific Coast and in the South you can hatch earlier than months mentioned.

After a pullet has reached a reasonable age and is unproductive, the relative profit from that bird grows less every day that laying is delayed. Profits in the poultry business will not permit the poultryman to ignore the importance of early hatches and reasonably early maturing stock.

By early hatched pullets we mean this, if they are intended for winter layers, they must be hatched at a time so they will just mature before winter comes on. If they are hatched too early they sometimes molt before winter and therefore don't lay much through the witner. On account of the different climates, birds having to be hatched earlier in some than others, we can lay down no set rule. No matter where you are located, hatch them just in time to mature by winter if you want winter eggs. If you expect to use them for breeding purposes next season, the earlier they are hatched the better.



AN EARLY HATCHED AND AN EARLY MATURING PULLET

A Buff Leghorn hatched in February, had matured and laid 87 eggs by the time she was nine months old. Laid her first egg when four months and four days old. She refused to pose for this picture and you fail to get her correct shape. Early maturing and early laying did not seem to stunt her growth.

DO YOUR BREEDING AT THE PROPER SEASON

From our observation and records we have concluded that the season of the year in which a chicken is hatched has much to do with its growth and development, and the length of time that it will require for a pullet to mature and begin to lay. That is, pullets hatched in the early spring when the trees are budding, the grass beginning to grow green, the crops growing, and the birds nesting; in other words, when the whole earth seems to be putting on new life, will begin laying in a shorter length of time than full sisters to them hatched in the summer or fall. We believe that pullets hatched in February, March and April will begin laying in a shorter length of time than their full sisters hatched in May, June and July. Climate would cause some variation and exception to this rule.

The smaller varieties begin to lay a little earlier or mature a little quicker than the large varieties, as a rule, but by using good judgment, a breeder of any variety can so regulate his hatches as to have them mature

just in time to make good winter layers. A poultryman can so select and regulate the breeding of his flock and so regulate his hatches that his pullets will bloom or begin to lay at something near a certain season, just as the florist has his chrysanthemums bloom at Thanksgiving and his lilies bloom at Easter. By all means, have them begin to lay before the winter season, for if they do not they will more than likely not start laying before spring. Such pullets are a dead loss for several months. The margin of profit in the poultry business is so small that it will not stand such a loss.

EARLY LAYING PULLETS COME FROM GOOD LAYERS

For several years we have made observations and kept records on our early maturing pullets, and in every case, no matter what variety of poultry it happened to be, the first pullets of that variety to begin to lay came from the highest laying hens of that variety, or hens among the highest layers. We have never had an early maturing and early laying pullet come from a medium or poor laying hen. In every case thus far, no matter what the variety is, the pullets which began to lay when they were from four to five months old were bred from the high laying hens of that variety.

PREFER HIGH AVERAGES TO HIGH INDIVIDUALS

The mere fact that a hen laid 300 eggs does not necessarily mean that hen would be a good breeder or would produce any pullets that would make a record of 300 eggs. Nor the fact that a hen only laid 120 eggs would not necessarily mean she would not produce some pullets that would lay 300 eggs. It all depends upon the breeding back of the individual. We would much prefer to breed from specimens that came from a flock of high averages, rather than to breed from freak or exceptional individuals from a flock that had only an occasional high layer. But if we only had two birds to select from and did not know the breeding back of them, we would choose the 300-egg hen mentioned above, rather than the 120-egg hen, all other points being nearly equal.

In selecting your breeders, it is best to choose only such specimens as you know have come from a line of consistent producers, generation after generation. You know that in individuals from such flocks, the racial characteristics to high production have been transmitted and that you would, therefore, run a better chance of having a good producing flock if you chose your breeders from high average producers, rather than from exceptional to freak individuals. A high average flock record is the best indicator in the selection of breeders for exhibition purposes or egg production.

MAY EXAMINE EGG ORGANS

The pullets which will prove to be the best layers, as a rule, can be determined by a physical examination of the egg organs when the pullets are quite young. An incision may be made between the last two ribs of a pullet when it is about 8 to 10 weeks of age, the same as if you were examining a cockerel for the purpose of caponizing him.

Instead of the male organs, you will find the ovary or cluster of eggs in the back of the pullet. You will notice that in some cases when the pullets are this age, the clusters will appear well developed, while in others, the clusters of eggs will appear to be very small. Birds at this age which show the greatest development will prove to be the early layers and also the heaviest layers.

In a test that was made, it was found that seven pullets showed large clusters of eggs and thirteen had smaller clusters and smaller eggs, one having a very small and dark looking ovary, almost black except at the extreme end. These pullets were all banded separately and in the fall the seven pullets were put in one run and the thirteen that had the smallest ovaries were placed in a separate pen. The seven pullets laid earlier than the thirteen, and when all of the birds had reached the age of eighteen months, the seven pullets had laid more eggs than the entire thirteen pullets and the one pullet which had the dark cluster of eggs in her body only laid forty-two eggs in the eighteen months and the chicks that were hatched from her eggs were infected with White Diarrhea. However, this one pullet was the best looking bird in the lot.

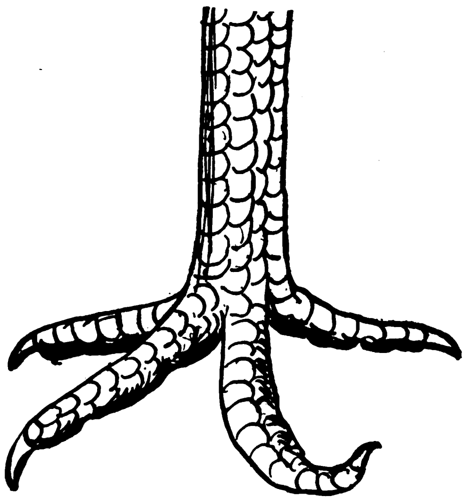
Since then, several experiments and tests have been made along the same line and it has been shown that every pullet with a well developed cluster of eggs has proven to be among the best producers, in every case. All pullets are opened and examined when they are about eight to ten weeks of age and those showing well developed clusters of eggs are marked to be kept as layers and future breeders, while the pullets which do not show considerable development of the ovary are sold as broilers or friers. This test was made with Barred Plymouth Rocks, but we believe it would prove equally true with any other variety.

A RULE FOR GOOD BREEDING

The question of good breeding can be summed up in a very few words:

Select the best Standard color and type in both the individual and in each and every characteristic. Reject for breeding purposes such individuals as are noticeably inferior of defective in any characteristic. Offset the minor faults and undesirable characteristics or tendencies of one parent by the superiority, excellence and strength of the corresponding characteristics of the other.

By following this rule, you are certain to make marked progress within a few generations and will eliminate noticeable faults and marked inferiority in your breeding stock.



A crooked toe is shown above. While this may be due to an injury in some cases, yet it is a mistake in most instances to breed from a bird that has a seriously defective or deformed foot. If such a bird was extremely good in other qualities, I would take a chance on breeding a few good birds from such a specimen. However, I would not sell such a specimen to a customer, neither would I breed from it if I could avoid it.

HAVE A DEFINITE OBJECT AND BREED TO IT

Why is it that some pens have a single hen in the pen of ten hens that will make a very high record and the remaining birds in the pen will be below the average? We think it is due to the fact that poultrymen like Barron have given much thought and much time to the question of selection and breeding for egg production. Such breeders have done some trapnesting, some pedigreeing, and they know the kind of males and females that they are breeding. Such poultrymen have selected and bred from 200-egg males, that is, males bred from hens with 200-egg records, so long that they have fixed the egg laying ability in the entire flcok, so nearly so that practically all their hens average well and make good records, barring sickness, accident, or improper methods of feeding and housing. While the other fellows have bred more or less promiscuously and unknowingly. Therefore, they only get an occasional high pen. A good fancier might see

an exceptionally beautiful bird exhibited by an amateur, but not knowing whether the bird had a line of good breeding back of him, a good fancier would not give much for such a bird to cross on his flock because the bird's good points might not be fixed by years of breeding, and he might not be able to transmit his good qualities. The same is true in breeding for egg production. In some pens, practically every bird gives evidence of years of careful selection and breeding, and another pen has only an occasional good bird which shows that these good qualities are not so firmly fixed in the flock. Mr. Poultryman, know the history and the pedigree of at least a few of your best breeding males. It pays.

WHAT INFLUENCE HAS SIZE ON EGG PRODUCTION, OR HAS EGG PRODUCTION ON SIZE

"We find that 90 per cent of the proven best layers by the trap-nest are the smallest birds," is a statement just made by one of our greatest poultrymen and one of our best students of the problems of egg production. The weight of the birds entered in the American Egg Laying Contest conducted at this place for the past five years and the egg records all indicate that this statement is absolutely true. No matter what the variety may be, if a hen of that variety makes a good egg record, upon weighing her we find she is usually from one-fourth to three pounds under Standard weight. "Lady Show You," the White Plymouth Rock hen which laid 281 eggs in our first contest, only weighed six pounds, being one and one-half pounds under Standard weight. "Missouri Queen," the R. C. White Leghorn pullet which led last year and made a record of 260 eggs, only weighed two and three-fourths pounds. This pullet was the smallest of thirty-six of this variety which were in the contest.

The Barred Plymouth Rock hen which made the highest record was one and one-eighth pounds under weight. The Black Langshan which made the best record was nearly two pounds under; White Orpington, two pounds under; White Wyandotte, one pound under; Silver Wyandotte, three-fourths pounds under; Buff Wyandotte, one-half pound under; Buff Orpington, two pounds under; Black Orpington, two pounds under; Black Minorca, one and three-fourths pounds under, and so on through almost the entire list of varieties. On the other hand, the majority of pure-bred hens which made the poorest egg records are up to Standard weight or considerably over, as a rule. Not more than 10 to 25 per cent of the best laying hens of any variety are ever up to Standard weight. During the past five years we have had birds from several hundred breeders, and our experience is that this is usually true, no matter what variety it may be nor from what breeder they may come.

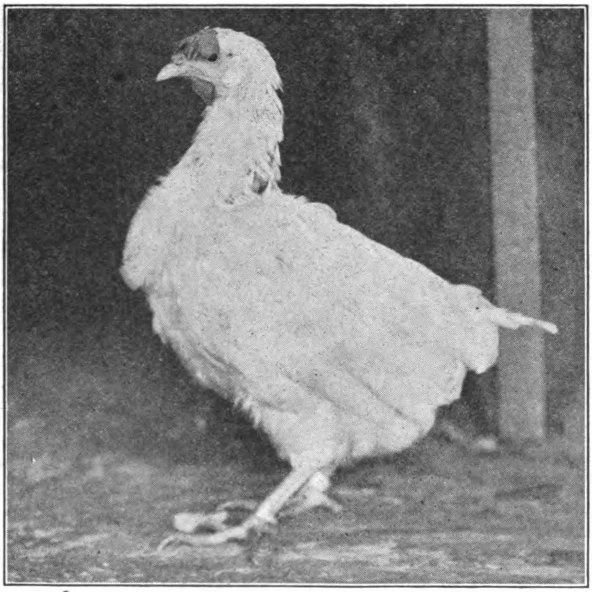
With dairy cows, the best producing Jerseys and Holsteins are not of the beef type. One of the leading dairy experts of this country once said to me when showing me his high producers: "These are our very best cows, but it sometimes disgusts me to hear visitors criticize them and make uncomplimentary remarks about these cows, and then compliment our heavier, fatter dairy cows of the beef type which give but very little milk or butter fat."

Can it be that we have our Standard weights on some varieties a trifle too high? We know of one quite prominent breeder of Barred Plymouth Rocks in this state, who has often bragged about having a strain of Rocks that were from a pound to three pounds above Standard weight. That same breeder is now disposing of his entire flock because they do not lay enough eggs to pay the cost of production. We think it best to have the Standard for all things quite high for the per cent of those who reach their ideals is quite small. We don't advocate breeding small birds, but we do think we can overdo the thing and ruin all chance of profitable production by going to the other extreme. Simply because a hen or a pullet was a pound or two under weight and was a good producer, healthy and vigorous, I would certainly not discard her from my breeding pens. It might be well to give this matter some thought.

You should bear in mind, also, the fact that pullets forced to lay too early in life might become stunted, thus egg production might affect size in some cases.

FREQUENT LAYING AFFECTS COLOR AND CONDITION

A pullet or hen may have yellow legs and beak at the beginning of the season, but after they have laid a large number of eggs, they apparently lay much of the color out of the beak, legs and plumage. If you see a hen at the close of the season with bright yellow legs, it is usually a good indication that she was not a good layer. If a hen is kept upon a bare lot without much green food, this will also cause the color of the legs to fade, so due allowance will have to be made for that in some cases. But a heavy layer of any yellow legged variety of chickens will approach the close of the season with faded legs, beak and feathers. Creaminess in the ear-lobes of the white ear-lobe varieties is an indication that the bird is not laying at such time. A White Leghorn or other varieties with white lobes are usually laying well if the ear-lobe is pure white and free from creaminess. The high layer will also have rough plumage that seems worn and "weather beaten." She might have started into the laying period a beautiful specimen, with



HIGH LAYING HENS MOULT LATE

As a rule this is true. You can see above, a hen that made a record of over 200 eggs and she did not begin to moult until December first. You may select a pen of ten hens, and usually the late moulters have been the best layers in that pen.

beautiful plumage, and good enough in most ways to command respect in a show room, but like a laboring man after a hard day's work in a shop, she naturally closes the season with her plumage worn and soiled, and considerably faded and out of condition as far as external appearances go. If she recovers from the molt properly and has her resting period, she will probably get back in as good condition as in the beginning.

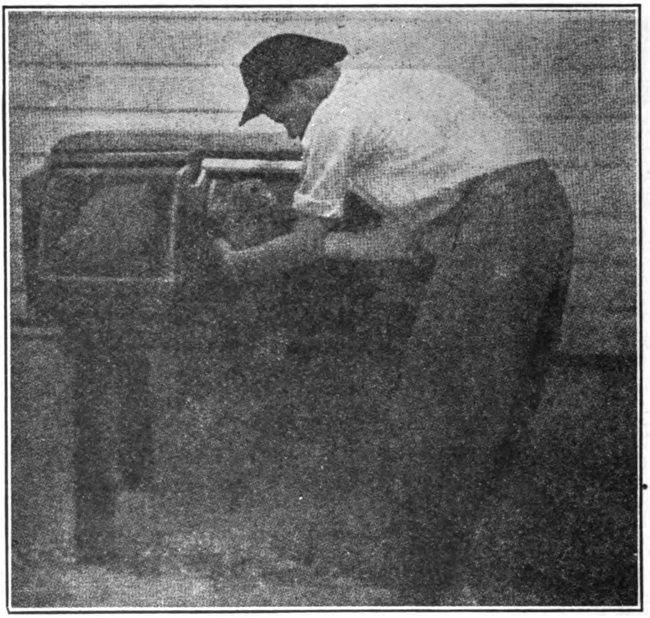
LATE MOULTERS ARE BEST LAYERS

The hens which make the very highest records are usually very late in molting. The high laying hens will continue to lay into October, November, or even December before they put on their new coat of feathers. If a flock of hens molt in the summer or early autumn it is a very good indication that they have not laid much. There are exceptions, of course, but this being true, we usually have to depend on early hatched pullets to a great extent at that period.

THE TRAP-NEST A VALUABLE ASSET

The trap-nest is a pillar on which we must build. It is not necessary to trap-nest every individual in the flock, but at least one or two pens of the choicest breeders should be trap-nested and the offspring marked or pedigreed so that you know the sire and also know the record of the hen which laid the egg. By the use of the trap-nest and by applying the Hogan test to the general flock, it is possible for any poultryman to know just what he is doing and this practice will enable him to discard all the drones. It is possible to make more rapid progress in breeding by this method than by any other.

There is no use making the excuse that it takes too much time to trap-nest. That is far from being the truth. It takes time to do anything that is worth while, and many poultrymen have utterly and miserably failed because they continued to stumble along in the dark, year after year, and never know what they were really doing, never actually knowing what they



Releasing the hens from the trap-nests. The proper method of taking them out—head first.

were breeding from. It matters not whether you are breeding for shape, color or eggs, or a combination of all, the trap-nesting of at least a few of your best birds, at least during the months of November, December, January and possibly into the spring months, will mean much to you in the course of a few years and put you far in advance of the man whose stock is unknown to him, except that he knows that he has "chickens."

The poor layers, those producing infertile eggs, weak chicks, poor colored chicks, slow growers, and chicks with many other defects can be spotted by the use of the trap-nest. You will discover the hens which lay large, even, well shelled and salable eggs, and also those which lay small, misshapen, unsalable eggs.

There is no use to say that you cannot take time to do a little trap-nesting. If the dairyman finds it profitable to use the Babcock tester in testing his cows for butter fat, and if it is profitable for the farmer to take time to select his seed corn, the poultryman can well afford to take time to trap-nest at least one pen of hens for two or three months in the year. In fact, the poultryman cannot afford not to do this. It is not necessary to

trap-nest the entire year unless you wish to do so, but at least do some of this work in November, December, January and February. Prof. C. T. Patterson, formerly of the Missouri Experiment Station, recently said this:

"One of the most important problems connected with the poultry business is the selection of the profitable and unprofitable hens from the viewpoint of egg production.

"Many methods have been tried in order to accomplish this, but the best method known to date is the trap-nest.

"During the spring season pedigreeing can be done if desired. Approximately two eggs are laid during the first six months for each egg during the last six months of the year, making the relative cost less. Then, too, the good hens can be rested during the last six months of the year, carried through the molt and put in good condition for the breeding yards the next spring. The low producers can be sold instead of feeding them through the period of low egg production.

"The averages of five hens in each pen in previous laying contests are: First or highest producer, 187 eggs; second, 161; third, 143; fourth, 122, and fifth, 96 eggs each. A study of these figures emphasizes the importance of selection.

"If the hens are selected by one month's record, the ones selected by being the highest for the month averaged 167 eggs each in one year, and the ones selected by being the lowest for the month averaged 115 eggs each in one year, there being a difference of 52 eggs.

"If the hens are selected by the six months' record, the ones selected as the highest producers produced 177 eggs in one year, while the ones selected as the lowest producers laid 105 eggs during the year, making a difference of 72, or six dozen eggs.

Most people place the bands on their hens just opposite the way they should. Place the band on the leg so the figures will be upside down when the hen stands on the ground. Then when you pick her up to read the band, as above, the figures come just right. The hen having been released from the trap-nest is held in this position when the band number is read and recorded. The band number is placed on the record sheet and also on the small end of the egg. By this method you know which hens are laying best, and which lay eggs that are infertile, and you learn many others things you should know. Trap-nest at least a few of your best birds.

"As this computation is based on per cent, or 100, it will be seen that to select one out of five means to select twenty out of one hundred, so that a breeder who has one hundred hens can select twenty of the best and after culling for defects, will have a good breeding pen, and in the same way can cull out and sell for meat the poor producers.

"Many questions have been asked as to the value of the trap-nest if used for a shorter period of time than a year. In order to answer these questions, the records of the four previous contests have been consulted, the object being to find the per cent of high producing hens which can be selected from a single month's record.

"The records used were of the previous contests composed of about 400 pens containing 2,000 hens. The table is given in per cent and was obtained from approximate averages of all hens used, fractions being omitted.

"The five hens in each pen were placed in the order of their egg production at the end of one month, to see what per cent of them held the same position as at the end of the year. To illustrate, the 100 hens which were the highest or first in each of 100 pens for one month, fifty-two were first at the end of the year, twenty-six were second, thirteen were third, six were fourth, and three were fifth.

"The following table shows the position occupied by each of the five hens in each 100 pens for one month and the per cent occupying the same position for the year:

	Per cent at the end of year				
	1st	2nd	3rd	4th	5th
100 hens in first place for month	52	26	13	6	3
100 hens in second place for month	26	40	18	10	6
100 hens in third place for month	13	18	38	18	13
100 hens in fourth place for month	6	10	18	40	26
100 hens in fifth place for month	3	6	13	26	52

"It will be noticed that of 100 hens which were first for one month, 52 per cent are first, and 20 per cent are second at the end of the year. Therefore, out of 100 hens selected by one month's record as highest producers, 78 per cent stand first or second place at the end of the year, and out of 100 selected by one month's record as the lowest producers, 78 per cent of them are the lowest or next to the lowest at the end of the year. Only a slight variation is found between different months. The indications are that it is better to select the high producers during the period of low production, and select the low producers during the period of high egg production.

"Selections may be made from six months' record in the same way as from a one month's record. The six months' record is better for selection than the one month's record.

	Per cent at the end of year				
	1st	2nd	3rd	4th	5th
100 hens in first place for 6 months	72	20	6	6	0
100 hens in second place for 6 months ...	20	52	20	6	2
100 hens in third place for 6 months	6	20	48	20	6
100 hens in fourth place for 6 months ...	2	6	20	52	20
100 hens in fifth place for 6 months	0	0	6	20	72

"It will be noticed that 72 per cent of the hens which were first place at the end of six months were first or second at the end of the year.

"The calendar year will perhaps always be used by agricultural colleges, universities, experiment stations, etc., but we believe that for practical purposes, the six months' record will become Standard by breeders who are developing egg producing strains, while breeders who want to improve their flocks by taking out the poor producers and selecting the highest producers for a breeding pen will find the month's record valuable.

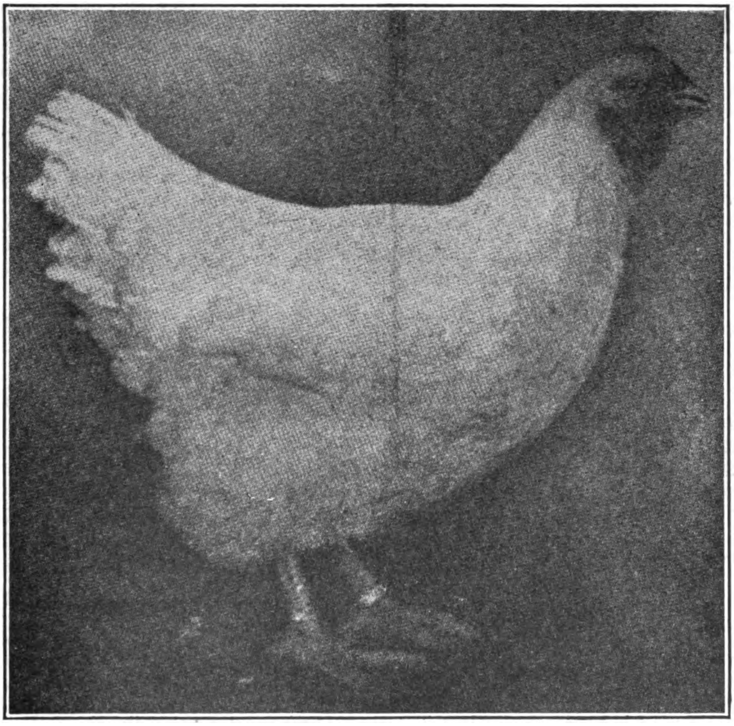
"This test should be used only with hens the same age and kept under the same conditions. Some of the advantages of the six months' record are: By using the first six months of the year, we get the records during part of the winter, all of the spring, and part of the summer."

LONGEVITY OF LIFE AND PRODUCTIVENESS

As well as producing pullets which lay a large number of eggs in one year, it is also advisable to breed from those birds which show a tendency to long life and profitable production for more than one year. It is too

costly to incubate, brood, feed and raise young stock to produce the kind which is broken down in health, or unprofitable and unproductive after the first year. Many hens lay well for three years. Although they may not lay as many eggs the second year, yet the net profit may be greater, because the cost of producing that fowl was paid for out of the first year's income. Some hens lay the most eggs the second year and some the most even in the third year. This is especially true with Leghorns.

If the hens are properly bred and cared for, many of them will average 200 eggs per hen for three years in succession. We trap-nested one hen that averaged nearly 200 eggs per year for five years. We cannot lay too much stress upon this important question, that of breeding, handling and caring



A GOOD EXAMPLE OF LONGEVITY

A White Rock Hen nearly eight years of age and had laid nearly 1,000 eggs. The first three years she averaged a little over 200 eggs per year. Her comb has been frozen off and she begins to show her age, but is still vigorous and a good breeder.

for your stock in such a way that it will be conducive to longevity of life and profitable production.

I would much rather have hens like these in my flock, and much rather breed from hens like these than to have a flock of hens whose race was soon run, which are like a flash in the pan, and which make a good record for a few months or for a year and then because of lack of vitality, are unable to stand the strain of heavy production, break down and die, or become useless and practically non-productive.

MANAGEMENT OF LAYERS VS. BREEDERS

The average poultryman does not distinguish the difference in the correct methods of management of the layers and breeders. They write to

know how to feed to get winter eggs and they keep dishing out beef scraps, green cut bone, dry mashes, moist mashes, and egg producing foods, and lots of it to their hens and pullets right up to the breeding season, and often continue right through the breeding season with this practice. This is all right for the laying stock for, in that case, you are after great numbers of eggs, but with the breeders it is quite different. It is fertile eggs, good hatches, and strong, vigorous chicks that you desire in the latter case. They cannot be gotten by feeding lots of heavy, rich, egg producing foods. It is best to trap-nest the pullets one season, to discover which are the most promising and which are the winter layers. Then give such pullets and hens at least two months' rest just before the breeding season. Keep them on just a maintenance ration and give plenty of range. Then as you approach the breeding season, feed a little more freely, but do not use much dry mash or beef scraps with your breeding stock. Depend mostly upon a grain ration, thrown into a deep litter to compel exercise. Give pelnty of green food, and provide for more range than is given the laying stock. We hope you will make this difference in your methods of management of the layers and the breeding stock.

THE BREEDING PEN BETWEEN SEASONS

After the breeding season has closed, it is wise to turn the hens and males out on range and let them rough it. Cull out those which have not shown up well during the season, and put them on the market. Those which are kept for another year should be compelled to hustle for much of their own living, kept on range and allowed to get in good condition for another breeding season.

POINTS WORTH REMEMBERING

Some facts worth remembering, which have been boiled down and briefly stated, are as follows:

First, that there is no variety or breed which far exceeds other varieties or breeds which are in general use as far as egg production is concerned.

Second, that more depends upon the strain or breeding of a variety as to the number of eggs it will produce than upon the variety itself.

Third, that some hens have a born tendency to lay and others have a born tendency to put on fat. The latter kind should be culled out in establishing a laying strain.

Fourth, that more depends upon the breeding of the male as to the number of eggs the offspring will produce than upon the female, yet it will pay to breed from your best layers in preference to the poorest.

Fifth, that you should select the variety which suits you best as to color, size and shape, and breed them up until they satisfy you as to quality and productiveness. You make a mistake by jumping from one breed to another trying to discover a better layer.

Sixth, that it will pay the average poultryman to trap-nest his flock in the fall and winter months and breed from the pullets which lay earliest in life and from the pullets and hens which lay in the winter.

Seventh, that many high producers lay thin shelled eggs, and that the germs are often weak. A few high producers are able to lay large numbers of eggs, fertilize them, and put vitality into the chick.

Eighth, that the Mediterranean Class can stand more protein and fattening food than the birds of the American, Asiatic, or English classes. There is not so much danger of the Mediterraneans becoming too fat, and they require a richer food than the other classes mentioned.

Ninth, that the egg yield from Mediterraneans is affected by extreme cold more than the other classes of fowls, because of the fact that they are closely feathered and have large combs and smaller bodies.

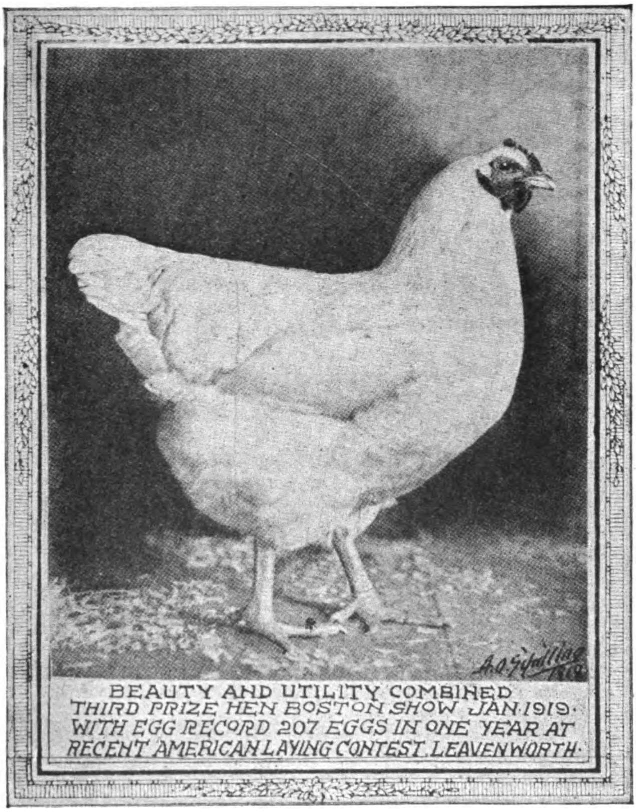
Tenth, that the purpose of properly feeding and housing a hen is not to feed eggs into her body, but to so feed and care for her that you may get out of her the eggs which breeding has placed there. Proper feeding, housing and care have a bearing on the number of eggs produced by a flock, but breeding is the most important factor.

Eleventh, that most high layers will lay practically all the color out of their legs and plumage in one year.

Twelfth, that hens lay a few more eggs when males are not used in the pens with them.

Thirteenth, that most good layers molt late in the season. They look tough, dirty and weatherbeaten as a rule as a result of their hard year's work, but the poor layers spend their time in dressing up and putting on a beautiful coat of feathers, and get them early, as a rule.

Fourteenth, that the best producers have broad bodies. The back is broad and the ribs are widespread, giving penty of room for the egg organs



This beautiful White Rock hen made one of the highest egg records among the White Rocks in the American Egg Laying Contest. Then, after moulting, won fourth prize in the Boston Poultry Show, which is one of the largest and best exhibitions in this country. This is further proof that beauty and utility can be and must be combined in the same fowl if we are to keep abreast with the progress which is being made in breeding by the most up-to-date poultrymen. This hen laid more than two hundred eggs in less than twelve months.

and digestive organs. Their bodies are solid and the birds are not loose jointed, but compactly built.

Fifteenth, that good layers are big eaters. A bird must have capacity to eat and digest a great amount of food if she is to lay a great number of eggs.

Sixteenth, that a big decrease in the egg yield in winter months can be brought on more quickly by great variations in temperature, sudden changes in weather conditions, than by continued or prolonged spells of either cold or rainy weather.

Seventeenth, that it will pay to keep a good hen until she is four years

old. We had several hens four years old which laid over 150 eggs each. The average hen is not profitable after the third year.

Eighteenth, that most of the high producers have good sized combs for birds of their variety.

STANDARD FOR EFFICIENT BREEDERS

Every breeder must measure up to a high standard of efficiency if one is to get the best results. This standard should apply not merely to production alone, but namely:

(a) The percentage of marketable eggs that bring highest prices.

(b) Percentage of hatchable eggs.

(c) Percentage of strong chicks hatched.

(d) Size and quick growing quantities of broilers that bring highest prices.

(e) Evenness of development and quickness in maturity of progeny.

(f) Time pullets lay from the time that they are hatched.

(g) The hen's ability to lay heavily over a number of years.

(h) Percentage of desirable breeders and salable birds from her progeny.

(i) Endurance to lay through severe weather conditions without materially decreasing her production.

(j) Prepotency of her cockerels.

(k) Color of plumage.

(l) General appearance.

(m) Size.

(n) Color and shape of egg.

Only hens are used as breeders—not pullets, thus size, vigor and stamina are maintained. Here is the schedule for selection:

SCHEDULE FOR SELECTION

Laying on November first, still in old plumage.

Weight nearly up to Standard, or as near it as possible.

Head—Beak short, stubby, broad, indicating vigor.

Eyes—Full, bright, alert, indicating vigor.

Skull—Medium in breadth, clean cut, free from excessive fat.

Comb—Large, serrations wide, good texture, and healthy color.

Wattles—Large, well shaped.

Ear-lobes—White, yellow pigment faded out in white lobe varieties.

Neck—Medium in length, well set on shoulders, indicating vitality.

Shoulders—Medium in breadth rather than excessive breadth, which indicates a beefy type.

Back—Long, very broad and flat over hips, found on practically all high class, persistent producers.

Keel—Long, straight, running well up to crop, giving fullness to breast. Well covered with muscle, indicating endurance after a heavy season's laying.

Shanks—Soft, medium in length, good size, feminine appearance, yellow pigment entirely bleached out from excessive heavy laying in yellow legged varieties.

Toes—Medium length, full, soft. Nail worn down, indicating vitality and alertness.

Breast—Full, indicating capacity and vitality.

GENERAL QUALIFICATIONS

Back—Carried generally level.

Body—Very deep from point on top of hips to keel horizontal. Free from hard fat collection.

Pelvic Arches—Three and one-half fingers in width, bones straight and very thin.

Body—Compact, each section nicely formed to give a symmetrical type.

Feathers—Hard and chalk white on white varieties.

Egg—Large and normal shape, chalk white in varieties which lay white

eggs and a uniform brown in brown shelled varieties. Eggs should weigh from twenty-six to thirty ounces to the dozen.

When walking in the pen must give an appearance of alertness, activity and intelligence.

TO AVOID "FULL MOLT"

Recently it has become a leading question of whether or not Leghorns, Anconas, etc., when kept under the most modern methods for prolific egg yield, NEED TO MOLT once or twice each year, resulting in a stoppage of laying for a period of four to eight weeks. In several cases lately we have come across record layers (chiefly S. C. White Leghorns) that either possessed the power naturally, or have had it bred into them, to avoid a "full molt," so-called, being able to molt gradually, "dropping a feather at a time," as it has been described to us, also to continue laying to good advantage (not an egg a day, but a good yield, nevertheless) throughout this period of discarding the old plumage and putting on an entire coat of new feathers.

It is quite probable that this valuable characteristic of "gradual molt" can be developed and established by selection and line breeding, to the extent of increasing by one, two or three dozen, the number of eggs each of these hens can produce in the year of her largest yield, perhaps applying successfully also to their second year of heavy production.

Furthermore, we find that the larger sized eggs these hens lay means "select" in the higher priced markets and we get five to eight cents per dozen more for them. High egg production alone does not mean greatest income per bird. The flock may be producing an inferior product, such as small eggs. It is important, therefore, that we secure good sized broilers, comparatively speaking, also large sized eggs that grade as "select" and bring best prices, because, as a rule, the excess price above the general market are net profit, or should be.

We keep some hens until they die a natural death, providing they have made good in producing heavily as pullets and yearlings and class up in TYPE, VITALITY and QUALITY of egg. This is another way in which we maintain the vigor of our flock. We even go so far as to select out the eggs containing weak germs when incubating, so that chances of getting a weak chick to start with are small. Eggs from some of our highest producing, trap-nested hens gave us 100 per cent hatch.

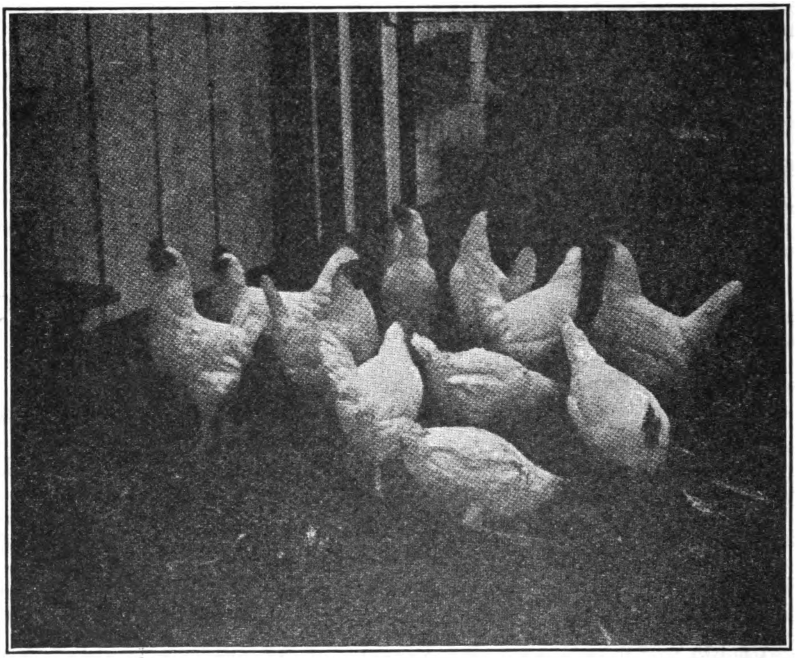
Few poultrymen realize the enormous strain on a hen to lay over 200 eggs a year and reproduce strong embryos. Unless vitality, endurance and laying type are combined, it does not take long to decrease the productiveness of any strain.

BARRON'S METHOD OF BREEDING FOR EGG PRODUCTION

Upon a recent visit from Tom Barron, of Catforth, England, to visit our Egg Laying Contest, we had some three or four days' visit with this best known of all poultry breeders. No poultryman in the world, in our opinion, has mastered the question of breeding for egg production any more thoroughly than has Mr. Barron. While he was with us we asked him dozens of questions and interviewed him on many important points. The facts learned were about as follows and he also made about these same statements in a public address while in this country:

"We have our own way of mating and I could not very well explain probably just how we have mated, only that I can tell you that we never use a cockerel on one pen of birds on the farm that has not been bred from a hen that has laid 200 eggs in a year. Now, this is a great point in breeding these pedigreed layers. I can give you probably some idea as to how I would recommend a man to begin with a new lot and still I could not really say. We always breed from 200-egg birds, that is all, and we breed the line down as nearly unrelated as we possibly can. I once did inbreed with curious results. I had some stock that I had been trap-nesting for a long time, probably ten years, and I thought, now, I want a change of blood and I will try and see what I can do, and from these I mated brothers and sisters together. Well, that is an awful mating as you all know, that is as close as possible. Well, from that mating, gentleman, I got the

worst layers that it was possible for a man to have. They were all put on the trap-nest, and I got a few of the hens that came somewhere near 200, about 200 the best. Now the parents of those were anyway 250; so that you see there had been a tremendous reduction through mating related blood, and I thought if this is bound to do harm I will not risk this thing again. I unfortunately sold some of this stock to some people, friends of mine, who thought that I was giving them some of the best stock on the farm, and I never heard the last of it. Anyway, it doesn't always pay you when you have a bad thing to give up, and I thought, now these birds are bred from good layers, they are bound to have the laying blood in them. What must I do with them? So with the best birds that I had there, the 200-egg birds, or near 200, I put an unrelated cockerel, entirely unrelated, and the result of that mating produced me some of the



Barron's pen of English S. C. White Leghorns. Ten hens averaged 230 eggs each in the Missouri National Egg Laying Contest. The best hen in the pens made a record of 273 eggs and only one hen laid less than 200 eggs in twelve months.

very best layers that ever this world produced, the best layers possible. But I have not attempted that kind of breeding again, because I had to waste a season to do it.

"I am not going to discount anything Mendel did. All I say is that so far as I know I have no use for it. We hear a lot about Mendelism nowadays, but my Mendelism is the wooden trap-nest. I trap-nest absolutely to find out the sons of the best layers. I like a good hen, mind, to breed from, but it is the sons of the best layers that the trap-nest is useful for particularly, in my opinion. I think the cockerel is without doubt more than half the pen, for the cockerel it is every time that transmits the laying qualities to the females without a doubt. I do not think you breed the layers through the females at all, although you are bound to have good females to breed cockerels. You must breed cockerels from good high-pedigreed females.

"I am often asked about the vitality of heavy layers. Well now, we

have critics in England. Your friend Daniel Brown is the greatest. He has been telling me ever since I began, telling the public, of course, that we are going wrong, that we are mad, that we must be very careful of this pedigree or we shall lose the stamina from the birds, but I do not believe so. A hen could not lay 200 eggs in a year if she did not have the stamina, and we do not breed from a hen that has not laid 200 eggs in a year, although I think it is fine for these men to tell us to be careful, because older heads are better than younger heads always. I find that year after year my stamina, if anything, increases rather than decreases. There may be something that I do not know, do not understand. I am not a college man. I have not a lot of college money to spend on experimental work. I have my experimental work to get out of my own pocket. We have nobody in England that helps us in this way at all. All that the English college authorities or officials that we have are good for is to produce table chickens. If you tasted an English table chicken, you would never eat another Leghorn. I think that last hatch that I had this year from 1,300 eggs, without testing the eggs at all, was 1,000, or 1,000 strong chicks from the eggs put in the incubator. I think that speaks sufficiently for the stamina of my birds.

"If I were beginning again I should begin with about twelve yearling hens entirely unrelated, if possible, with pedigrees well over 200 eggs each in their first year's laying. Mind you, I have come to this conclusion after testing different ways of breeding. These hens would be numbered 1, 2, 3, in each pen. Cockerel for No. 1 pen would be numbered 1, in No. 2 pen would be numbered 2, and in No. 3 pen would be numbered 3 and in No. 4 pen would be numbered 4. There would be the band numbers of the cockerels. These hens would be numbered 1 to 12—1, 2, 3 in the first pen, 4. 5, 6 in the second pen, and so on in the different pens, the progeny of each to be toe-marked. Now, we toe-mark the biggest part of the pedigreed stock, but if you do not toe-mark them use leg bands, numbered. The progeny ought to be all toe-marked and numbered with metal rings. The first number on the rings ought to be that of the male, so that means that you would have two numbers on each ring. The first number on the rings ought to be that of the male in each pen, the second number that of each female. You would then know that bird No. 11 was bred from No. 1 hen in pen 1, cockerel 1. You see that? Also, bird No. 22 would be from No. 2 hen, say in pen 2, cockerel 2, and so on. In this way you would have different ways of mating; four different ways of mating entirely unrelated, and you would keep entirely unrelated for a long time with those twelve birds. You want to use your own judgment as to how to do this, that and the other. You have to use your own good sense, and if a man is particularly interested, it is surprising how he can use these matings backwards and forwards and keep them fairly unrelated for many, many years. Supposing you think that you have inbred or that you are inbreeding and you want to produce some new blood at any time. It is far preferable to manufacture this new blood yourself than to go outside your own yards for it unless you go to the same breeder you started from in the first instance.

"Well now, if I wanted new blood I would pick out a pen of females as nearly unrelated as possible and put them in a pen there and mate to that pen two cockerels; these cockerels would be entirely unrelated to those hens and entirely unrelated to each other. I should use one cockerel on a pen of hens five (5) days, then I would take out that cockerel and number him, then put in the other cockerel for five days, and in this way would manufacture blood that is marvelous for mating to almost any hens and marvelous for laying, too, so that you see there is any amount of different ways a utility man can mate up his birds. Now, I have no set way of mating my birds, but I keep them unrelated as nearly as possible and always try to mate my pens with cockerels bred from the highest pedigreed hens possible, provided these pedigree hens have a good constitution, provided they do not lay a small egg, or a rough shell egg, or a bad shaped egg, or anything of that kind. I like a nice egg, a big egg.

"Now, using these birds alternately five days, as I say, you can produce a lot of new blood to mate to almost any pen. In fact, in my breeding, I consider it better to use two brothers to each pen, as it is likely one

might be a better breeder of layers than the other, exactly in the same way that one sister can be a better layer than the other. Well, you see, as I say, I should prefer to have twelve or thirteen hens in a pen and put two brothers to mate to that pen; take one brother out of the cockerel box, we have these in our pen, and in there we always keep a reserve bird and we change these birds every five days. It gives the cockerl a rest, and sometimes, as you know, if he is a very vigorous bird, he will pick around and not eat anything at all himself and probably produce a lot of infertile eggs, but if you have this two-cockerel system of mating you produce a lot of better eggs all around, for fertility and stamina. We mate up, as I say, about fifteen hens to a cockerel or to these two cockerels, and change them every five days. Well now, I do not always breed from two brothers. I might have a pen of sisters—when I say sisters I mean ten pullets or ten hens, all bred from one hen—that have a pedigree of, say 240 or 250 eggs a year, as the case may be. Well now, I mate two unrelated cockerels to these hens sometimes, two cockerels that are not brothers, distinctly unrelated, and I have found that they produce some very fine stock, indeed. Of course, some people say, 'How do you know where you are going?' but as long as it is unrelated on a utility poultry farm that is all you need to do.

Q. You mention the word cockerel. Do you never use cock birds at all?

A. Yes, we have birds on our farm, cocks that are five (5) years old, some of them. If we find a bird is a perfectly good breeder we consider that bird invaluable to breed layers and keep up this new blood. And the same with females, too. We have females on our farm that are 5 to 6 years old. If these birds only lay just a sufficient number of eggs in the springtime to produce a few pullets or a few chickens, that is all we require of them. I think they have done their duty. Of course, it is a very expensive way of breeding, but keeping up a stock of birds like I have kept up is a very pretty expensive job. I think it is more probably a specialist's job than an ordinary farmer's. It would probably pay a man better to keep out of this kind. We have several in England that are making a specialty of this kind of thing.

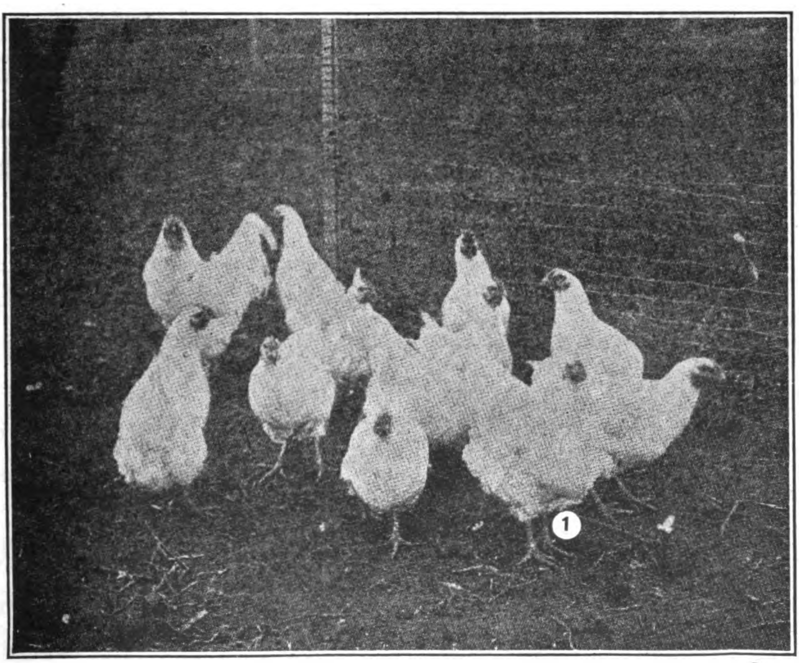
"In our pedigree breeding we many times test a pen of pullets, because if you do not know how they breed by two cockerels or one cockerel, as the case may be, it takes a year longer to do that. In the first year we test pullets with certain cockerels, and from the progeny, by toe-marking and the pedigree rings which we use, we find out a year in advance, as it were, which cockerel we bred the best by. Well now, you wouldn't expect that I would be such a big dunce as to breed from pullets to send to a laying competition in America! I have tested those pullets the year before to find if they produce good layers by a certain cockerel, then the year after I have their special pullets to send to the laying competitions. Now, I want to put plenty of stress on that point, breeding from good hens, your cockerels from good hens. Now, do not think you need to go and trap-nest all your birds if you have a 5,000 plant. I do not mean anything of that kind, but I think you could do a certain amount of good, you young men, probably the old men have that same interest, and if the old men like to take it up that is all right, it is a long job and will take a few years before you get into it, but I think if you would only trap-nest a pen of 100, perhaps, or fifty, if you like just to produce cockerels, just to find which are the hens to breed cockerels from to mate up with your birds, I think you will gain probably thirty or fifty eggs more in the two years' laying of a hen, or probably more than that, if you will use these hens' cockerels rather than those of any hens at all.

"I have tested my best pedigree cockerels sometimes with a pen of hens that have never been trap-nested, just merely ordinary layers. Well, that year I had the best results. Well now, I think if you people that have plants—you do things in a big way here, you know—in England there are not very many of us who have plants of two or three thousand laying hens, while here it is quite a common thing for a man to have two or three or four thousand hens. Well consider, isn't it worth while to trap-nest a pen

of pullets, say fifty, to find which hens ought to breed your cockerels? I think it is. If your flock of two, or three, or five thousand layers would lay you twenty eggs per bird per year more, or perhaps thirty or forty—Mr. Collingwood expects that we will have hens laying 365 eggs in a year—I think if a hen lays 200 eggs, that is sufficient for any hen to lay—if you have a pen of hens that will lay 200 eggs on an average—that is quite sufficient for anybody. I think you ought to trap-nest a few birds to produce cockerels to breed along your stock for producing eggs, because I am certain that there is a tremendous possibility in this country for egg production.

"There is another little point that I want to mention and that is, there is a right time to hatch chickens, especially for winter egg production, if you want to hatch White Wyandottes and want to hatch them at the proper time. It is too late in May to hatch them for laying on the general farm. I think White Wyandottes ought to be hatched about March of any year or probably the first or second week in April. Now, to get the best results with the Leghorns, the best time to hatch them is in the second week in April or probably the first. You can do wonderful things for eggs in the winter time. This is the time that pays the best. I might also mention that with our pedigree these chickens can be hatched at the right time so that they will lay better in the winter time. In my pedigree breeding I make a specialty of breeding from the hens that lay the biggest quantity of eggs in the dearest months of the year. In England our contests are run on egg value. These contests are not run on the quantity of eggs. I do not know which is the fairest way, I am sure, but if I were running on egg value I could win laying contests faster than on quantity of eggs, because we pick out the hens for breeding the best cockerels from the pullets and hens that have produced the best in the winter time. Now I think there is something in that.

"I may also mention that we toe-punch them straight away. A male



Hen marked No. 1 was a large round bodied American type Wyandotte. The remaining hens were Barron's long bodied English Wyandotte hens. The small, long bodied Wyandottes laid 205 eggs each on the average. The exhibition type Wyandotte only laid a little over 100 eggs in the twelve months.

from a heavy laying hen will be more sure of producing heavy layers than if you use a heavy laying female. Now, I made mistakes in the first place. I used to breed from all my very best hens and I did not take as much notice of the cockerel, but I found out that the cockerel is without doubt the greatest point.

"There is another point, too; not always is the largest hen the best layer, but generally the smallest hen. In ninety-nine cases out of a hundred it is the medium sized hen that is the best layer and always the hen that is inclined to be squirrel-tailed, whether it is the Wyandotte or Leghorn.

"Now there is another thing, and that is, my birds have white legs. Now look here, did you ever see a hen in your life that laid eggs that did not go white? If you get some hens that have yellow legs at the end of the year sell them. That is a sign that they have laid no eggs that year, practically none. A White Leghorn, if she has a perfectly yellow leg when she begins laying, will have a white leg at the end of the year; this is a fine indication.

Q. What do you mean by squirrel-tailed? Do you mean a tail that goes back?

A. Yes; I will show you later.

"The best layer and best shaped hen I ever saw had a wedged shape, the right wedge shape. She had a medium full breast, rather inclined to be squirrel-tailed. I like a hen with a good cushion behind her, a good length from the breast right to the back. This is an indication that she has a long breast bone. I like her a good depth, right through, and a good width across the wing bars, and I like them to have rather a long neck.

"Now, I do not think I like a big comb, and there is a point that I have been trying to breed out all my life, these big combs. They are bound to get frosted in winter, and I have tried my best to breed a little comb bird. Well now, I cannot do it so I am not going to try any longer, simply going to give what the trap-nest tells. I like the comb to be of a very fine texture. If it is big it wants to be fine, and the legs do not want to be thick, they want to be very fine. I like a very fine leg and I do not like a hen to stand too long on the shanks. My Wyandottes probably do stand a bit too long. It is a thing that I have been trying to breed out. I like a short-legged bird. They are the best layers. Well now, is there anything else you would like to ask me?

Q. Do you mean, then, that the large comb goes with better egg production?

A. It seems to have done so with my birds without a doubt.

Q. Is that true of the Wyandottes as well as the Leghorns?

A. Exactly the same.

Q. What is the weight of your Wyandottes?

A. My Wyandottes would weigh about four or five pounds as pullets. I do not like big hens; you always get the worst layers.

Q. You spoke of a cushion on a hen. Will you please explain what you refer to as the cushion?

A. Well, I mean that I like to see them a fair width across the back and with plenty of fluff.

Q. What do you say in regard to a large comb being a sure sign of superior vigor?

A. Well, I do not like a beefy comb. I think the very best layers are apt to produce big combs. I always produce big combs.

Q. Do you find those to be stronger birds?

A. Yes, I do. If we breed any small comb birds at home they are always weaklings. You would not really breed from them. And naturally, you would not like to see a cockerel in a pen that has a small comb, you can see he is a weakling. You would not think of breeding from him. He would not have enough vigor.

Q. What about a thick comb? Do you like it?

A. No, I like a fine texture of a comb.

A typical White Leghorn utility cockerel bred from a 250-egg hen on my farm at home might have a squirrel-tail, a long flowing tail. That cockerel would have a pretty short leg, pretty wide breast, stand straight

up like a soldier, have good feathers and inclined to be rather squirrel-tailed with a prominent, alert eye.

Q. Do you think that the feathers make much of a difference in the appearance of a bird, whether loose or rather tight?

A. Certainly, a tight-feathered bird is always a better layer than a loose-feathered one.

Q. Wouldn't that account for some of the difference in shape?

A. No. I don't think so. You can see that the feather has nothing to do with the difference in type, that is in shape. Look at the difference in the length from the head right to the tail, see—quite a different bird altogether.

Q. Mr. Barron, can you in any way account for such a change in shape, both types being true?

A. (Illustrating with live birds, Wyandottes, one of his own egg type and another of the American show type.) Yes, this kind has been produced with an eye to a certain standard. They have tried continually to breed for big size of the bird and they have got them into this snowball shape, where this one has never been tampered with for shape; she has been bred absolutely for laying, that is all. See? This man has bred for a certain standard and he has produced this bird here, while we have bred by the trap-nest, and this is what I have produced, here. This only goes to show, for what it is worth, the difference in two birds. Well, which bird would you consider would lay the most eggs if you were choosing from the two birds?

Q. How far can you keep going away from the Wyandotte on the left hand side and still call it a Wyandotte?

A. I don't know, and it doesn't matter a hang how it goes or where it goes.

I have nothing at all to find fault with in the American Leghorns, do not see why they are not as good layers as ours—in fact, I think they will soon be as good. They have not ruined the Leghorns, and that is what our Englishmen have done. The American White Leghorn is a splendid bird without a doubt. I could breed my White Leghorns to the American Standard (I think they are prettier than the shape that I have), but I am not going to spoil my shape for either the American or the English. I am going to stick to what I have as long as I can produce a hen that will lay 200 eggs a year.

Q. Do you think the Americans have hurt the Wyandottes any more than they have the Leghorns?

A. Well, I haven't taken that much notice of the American Wyandottes, but I don't think they have hurt the Wyandottes as much as our men have. You fellows have more business ten times than our English exhibition men have because you go for the eggs, you see. You have the sense to think that a hen must lay so many eggs to keep herself. You do not breed for feather altogether, and I think your Leghorns are fine.

Q. What egg production will you get in the average flock?

A. About 200. Fifteen birds in a pen would average 200 from decently selected birds, and probably more, might be 230 or more.

Q. What would it be from larger flocks?

A. From larger flocks you would get less, according to size. The larger the flock the less quantity of egg. That is my experience.

Q. How do you account for that?

A. Perhaps the birds do not get the same advantages, they do not get the same conditions, probably they fight each other about feeding, and all that kind of thing. There is something; what, I cannot tell you. If a lot of people were in this room I don't suppose they would do as well as a few.

Q. Which do you consider the best layers, Wyandottes or Leghorns?

A. I think White Wyandottes lay the most egg value, but the White Leghorns will probably lay more eggs; probably there is not very much difference in them.

Q. How do you determine that egg value according to your English figuring?

A. Well, we reckon up each week, the average market price each week. One week we might get seven shillings, next week we might get eight or

nine and so on. You do not figure on the weight of the eggs. That is what we do in the contests.

Q. Is that what gives the Wyandottes the egg value over the Leghorn?

A. Not at all, the Leghorns lay as big eggs, probably larger.

Q. What gives the White Wyandottes the extra value over the Leghorn, do you think?

A. In the egg production in the winter time at the right time of the year.

I dare say that you could get on pretty well in trap-nesting four or six months in the winter time, but this is not as accurate, I think, as the twelve months' record. Some people in England have adopted the system of trap-nesting for three months and some six months, but I don't believe in it. I think a hen ought to run through twelve months so that we shall see exactly her test for the twelve months.

Q. Do the heavy producers as a rule lay as large an egg as hens that lay around 200? The 250-egg hen, is she apt to lay as large an egg as the hen that lays about 200?

A. No, I think she would probably lay a rather smaller egg. Of course, some do and some don't They vary, but I think rather generally the hen that lays the larger number would likely lay the smaller egg.

Q. Then if you were breeding for commercial eggs and wanted large eggs, that is, better than 24-ounce eggs, you would use a male bird bred from a female laying large eggs?

A. Decidedly, yes.

Q. How much influence have you observed that the male has on the size of the eggs,at least half?

A. Well I think so. If the male is produced from a large egg female, I find that my eggs are all right from the progeny of that mating.

Q. Do you breed any of the larger strains of the Wyandotte?

A. Only the White Wyandotte, the Buff Rock and White Leghorns. I keep only three breeds. I think a man ought not to have too many breeds.

Q. What do you think of the Buff Rocks?

A. They are very good indeed.

Q. In your pens of fifteen, that is all those fifteen hens, their progeny is all banded as under one number?

A. If I had a hen in pen fifteen that laid 260 eggs in a year, I should band that on a certain band number according to her number; and if another hen laid 240 I should band that with that certain number of hers.

Q. You keep the progeny of each hen separate?

A. Separate, yes.

Q. But only in instances where you have especially good hens?

A. Yes, in extra good hens. We do not do all the stock like that.

Q. What do you use for a band for little chicks?

A. A little small aluminum band with the number on. They go right on the legs of the chicks. Pedigree breeding is an awful nuisance.

Q. Then you take that band off as soon as the chick has outgrown it and put on another?

A. Yes, until the chicks get big enough to take a numbered ring band.

Q. So that you use in all three (3) bands before you finally band that chick with a sealed band?

A. Yes, sometimes more than that.

Q. I noticed on the bands that came on your stock the numbers were all raised.

A. Yes.

Q. I never have seen anything of that kind in this country. Is that common with you?

A. Yes, because you see ours is such a dirty country. We get so much wet weather; when the birds walked about in the mud they got the mud caked on the bands, so we adopted the raised letters because they are much easier for us to see than the sunken letter on account of the dirt.

Q. Evidently you do not know the father of each one of your chicks?

A. I do, of practically all the birds I have on the farm.

Q. How can you do that with your system of double-mating?

A. Well, of course, two brothers, but I call it the same father.

Q. Well, might there not be a tremendous difference in the egg production qualities of the two birds?

A. I think there is and that is why I do this. Supposing we used a bad male in preference to a good male, which none of us can tell, we might get the wrong one occasionally. We breed from two-year-old birds as well as one-year-old.

Q. Mr. Barron, do you sort out your future hens from growing pullets while they are growing?

A. I pick my pullets; the lot of them probably go into the big house, and I pick from them as to type and shape in the big house before I move them into the little breeding pen where we trap-nest them. I select them for type in exactly the same way as you saw me select birds here today.

Q. How old do you consider it advisable to keep layers?

A. Two or three years; they will do pretty well the third.

Q. What is the matter with the fourth?

A. They lay too few eggs.

Q. In all your breeding, did you ever come across one sire that was away beyond any others in giving good producers? Now, in breeding cattle we can often get a sire that gives calves that will produce more milk than any others. Now, in your breeding of hens, do you get hold of a male once in a while that is far ahead of anything else?

A. Sometimes we find a male that is invaluable as a breeder and I have seen his brother that would breed nothing at all. Not often, but I have seen that."

THE SELECTION AND BREEDING OF LAYERS

By Prof. James Dryden, Covallis, Oregon.

Before taking up the discussion of selection of layers, permit me in a few sentences to point out the immense importance of this subject, not only to practical poultry keepers, but to millions of other citizens who cannot keep house without eggs.

Two or three thousand years ago eggs were not eaten—were not used for human food. Since the domestication of the fowl, which occurred about that time, the civilized peoples of the globe have become more and more dependent upon the egg supply as a source of food. Today the egg eaters of the globe are consuming two or three billion dollars' worth of eggs alone per annum. In the United States, the production and consumption of eggs amounts to about half a billion dollars a year, an amount which, added to the value of chickens produced, is sufficient to pay for building two Panama canals.

The only reason the consumption is not double what it is in this country is because the price of eggs, or the cost of production curtails consumption. The people are yearly demanding more and more eggs. But very few consumers, comparatively, can afford to pay 40 and 50 cents a dozen for them.

The problem for the poultry keeper is, can he, by improved methods, produce eggs at cheaper cost so he can get his profit? The problem for the consumer is, can production be so increased that he can secure the eggs he wants at cheaper prices?

If by better methods the hens of the United States can be induced to increase production by only sixteen eggs per hen, that would mean, on the present basis, an increase in production of a hundred million dollars a year.

The subject for me to discuss is, what system of selection can the poultryman follow so as to get a better production from the flock? I will discuss the subject under five headings, as follows:

1. Ancestry or production.
2. Breeds and breed characteristics.
3. Type or conformation.
4. Laying maturity.
5. Hen temperament.

As to the first method—selecting the layers by the production records of their ancestors—can we predict from the records of the ancestors what

the production of the pullets will be? Suppose we have two flocks of 100 pullets each. One flock has ancestors with records of over 200 eggs a year, the other less than 100 eggs a year. Other things being equal, will the one flock prove to be better layers than the other? This system of selection means that we must begin with the mothers and grandmothers. We must select the mothers and grandmothers and the fathers and grandfathers of the pullets. We accept the pullet which has a good mother and grandmother, no matter what she may appear to be herself. That is the question of heredity.

The second point means that we select the layers by the breed or breed characteristics. The question often asked, What is the best breed for laying? comes in here. Are there any differences in breeds that indicate laying quality?

The third point—type and conformation has to do with the shape or form of the fowl. Can we take the pullets, regardless of their ancestors and regardless of their breed and pick out the good layers by some peculiarity of shape or form?

The fourth point refers to stage of laying maturity. Is early laying maturity correlated with high production, or the reverse? Can we pick out the best layers by observing the days or ages on which they begin to lay?

The fifth method of selection has to do with what I might call hen temperament. Has the high producer a temperament distinct from that of the poor producer?

There are other methods of selecting the best layers that might be mentioned, but these five are sufficient for this time. Some people select their laying hens from the showing of ribbons won at poultry shows. Others select them on the "say-so" of some advertiser that his hens are the best layers on earth.

Now, I want to warn you a little here. I don't presume to know all about these methods of selection, or all about the problems of poultry breeding or selection of layers. I have no secret of selecting layers to give you. I will give you the results of some study and investigation during the past ten or twelve years or more, and when I think of it I am ashamed at the length of time it has taken to arrive at certain definite conclusions, and one of those conclusions is that there is no royal road to the production of high laying strains of fowls.

Let us first discuss briefly the evidence of the first point. Can we pick out the best layers on the basis of production records of the ancestors, ignoring breed, ignoring type, and ingoring conformation and other things? Can we shut our eyes to the flock and select them from the book? Is it a question of bookkeeping or skill; is it a science or an art?

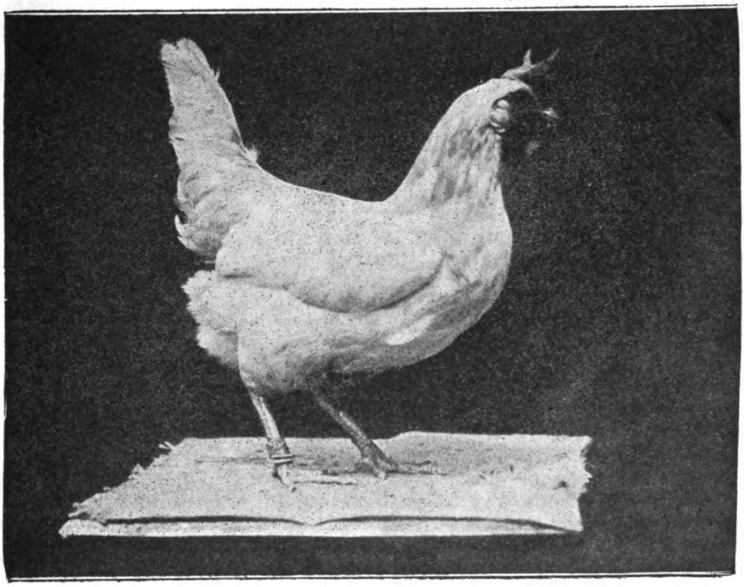
If high egg production comes by inheritance, if good layers are produced by good layers, then the question of selection of good layers is a question of bookkeeping or a question of keeping production records.

Is big egg production inherited? Can we increase production by breeding the best to the best? There has not been sufficient evidence that we can. There was evidence that the contrary was true. You remember the widespread discussion created by the publication of a bulletin by the Maine Experiment Station several years ago, in which the results of nine years' experiments were reported. The results showed no increase. The question was warmly debated as to whether or not egg production had not already reached a point where futher improvement was impossible. Within the last two or three years, however, our ideas of the capactiy of the hen have been greatly enlarged. Ten to twelve years ago when we found a 200-egg hen, somebody would write to the papers and say, "There ain't no sich animal." Later it was acknowledged that there were 200-egg hens, but their tribe would never increase—their eggs would not be fertile and if fertile, the chicks, from lack of vigor, would die an early death. The 200-egg hen would not produce a 200-egg hen, it was said. But since then our visions have enlarged. We have lost interest in the 200-egg hen. She is a common every-day creature. It is the 300-egg hen now. The 300-egg hen has come, but she gets about the same reception that the 200-egg hen

got a dozen years ago—a cold one. The record is either doubted or the hen as a freak or a monstrosity.

But my question now is not whether we have 200-egg hens and 300-egg hens, but whether high producers transmit their laying qualities to their offspring.

My experiments at the Oregon Station began about seven years ago. These experiments were designed primarily to solve this question of inheritance of fecundity. Individual selection was followed, using the trap-nest records. We tried to avoid any other issues. Production records were the only basis of selection of breeding stock. The question of type was avoided because we wanted to settle one problem at a time. We, however, kept records on certain points of type. The long bodied pullet, as well as the short bodied pullet were kept if the production records of their parents were high. It was not a question of breed or type, but whether hens of any breed or type, or of no breed, inherited heavy laying qualities. In these experiments, breeds



Lady Eglantine laid 314 eggs in 12 months in the North American Contest. This is a White Leghorn hen owned by Eglantine Farms of Greensboro, Maryland. The record was made and the contest handled under the direction of Prof. Stoneburn and F. V. L. Turner of the North American.

and breed points were not essential. The problem would be solved, if solved in less than a century, by limiting the scope of the experiments and ignoring the question of breed or color or shape.

This, I believe, is the foundation problem and the whole future of the poultry industry, as an industry, rests on its solution.

What is, therefore, the effect of selection on the basis of production or trap-nest records? Does the production of the parents give any indication of what the production of the daughters will be?

In our experiments we used two breeds, a light breed, the White Leghorns, and a heavy or medium breed, the Barred Plymouth Rocks. In the first year, ninety-five Barred Plymouth Rock pullets, which were purchased from six different breeders in Oregon, laid an average of 84.7 eggs in the first twelve months of laying. There was one hen, and only one that laid 200 eggs or more, her record being 218.

The following year, twenty-eight pullets, hatched from the original stock, averaged 121.2, the highest individual record being 183 eggs.

The next year a flock of forty-three pullets, which were raised from the original stock of ninety-five after one-third of the poorest layers had been discarded, averaged 164.6 eggs, the highest record being 250 eggs.

In the fifth year the pullets, 103 in number, were all from pedigreed high producers. The average of the flock was 179.2, the highest record being 268 eggs.

In the sixth year there were 160 pullets which averaged 176.5, with highest record of 271.

No new blood was introduced during the six years, but inbreeding was avoided. The conditions of experiments were kept as nearly as possible the same year after year. The same rations were fed and the same kind of housing and yarding was used. It is not possible, of course, to keep the conditions absolutely the same year after year. If nothing else, there will be changes in the weather that might affect the results.

As a check on the conditions, however, we selected strains of poor layers and bred them, averaging all the results up to the end of last year. Where they were all comparable, it showed that the pullet progeny of selected high layers produced an average of 207.3 eggs, while the progeny of selected poor layers averaged 138.1 eggs.

It should be remembered that individual cases do not prove very much. To settle this question we must deal in averages. I could show you, had I time, high records of individual cases where the parent stock were poor producers. We have, in fact, had phenomenal individual records where the mother and sire's mother were low producers.

Is the problem of higher fecundity a question of selection altogether, or is it a question of constitutional vigor alone? Does the work of the breeder begin and end with selection, or does it begin and end with vigor in the stock? It is well known that crossing two breeds and varieties will restore vigor that has been lost by inbreeding, and this is accomplished in one cross. My experiments have to do wholly with the question of inheritance of high laying. We wanted to know whether high fecundity was inherited or not. We sought to solve the problem in different ways. We used two different pure breeds and we used crosses of the same. We sought to eliminate the question of constitutional vigor by using crosses, and crosses that had been graded up with pure-bred males. It was not a question of crosses or no crosses. It was not a question of whether crosses laid better than pure-breds, or the reverse, but whether high egg production was concerned with heredity or not. Was constitutional vigor more important than heredity? And one way to settle this point was to take the short cut to constitutional vigor and cross. Otherwise how were we to know whether the increased production secured was not due to increased vigor? It was not a question of the value of blood lines. It was rather a question whether we could maintain blood lines by close breeding and get the full benefit of the hereditary tendencies to lay, whatever they were. The experiments would be worthless without the use of stock of equally high constitutional vigor each succeeding year.

Fifty White Leghorn pullets purchased from a number of breeders in our state averaged 106.9 eggs, the highest record being 183.

In the following year sixty-three first crosses of the White Leghorns and Barred Plymouth Rocks averaged 135.6, the highest record being 211. Four and seventy-six hundredths per cent of them laid 200 eggs or more. This result in the second year might fairly be accepted as what could be expected from high constitutional vigor alone. Here we have an increase over the first year Leghorns of about thirty eggs per hen. It will be understood that so far as constitutional vigor is concerned, other things being equal, we would get as high production with the first cross as with any subsequent crosses. But the increased production continued year after year, showing, I think, very clearly, that there was something else responsible besides constitutional vigor.

In the fifth year the flock of pullets which had been produced by grading up with pure-bred Leghorn males from heavy producers averaged 218.2 eggs, with a high record of 303 eggs, and with 69.5 per cent laying over 200 eggs.

In the sixth year, by grading them back to the Barred Plymouth Rocks with pure-bred Rock males from high producing stock, so that the pullets had slightly more Plymouth Rock blood than Leghorn blood, the average was 223.7 eggs, with high record of 278, and 70.6 per cent of the flock laying over 200 eggs.

In the seventh year, which has just closed, the results corroborate those I have given. We have secured this year, higher pen records than ever before and higher individual records. You will understand ,therefore, that the object in crossing in this experiment was to discover evidence, whether high production depends on constitutional vigor or whether is comes by inheritance.

Our results clearly show that high egg laying is inherited and that the poultry breeder can make rapid progress in breeding up the productive qualities of his flock by keeping books—in other words, by using the trap-nest and breeding the best to the best year after year.

I have not time to go into the question here of the mode of inheritance. Does high production come about all at once according to the Mendelian law of dominance and recessiveness, or is it an achievement that comes bit by bit after years of patient, selective breeding? Is high egg production a sex limited affair in its inheritance? Is it inherited from the dam and dam alone, or does it come through the sire and sire alone? These are all important questions. We have accumulated a great deal of material on these questions, but are not yet ready to announce any final conclusions. So far as our investigations have gone, however, the results do not bear a Mendelian interpretation. They do not show that high egg production is either dominant or recessive to low production. When high producers were mated to sons of high producers, the daughters were neither all high producers or all low producers. Mating high producers together, the daughters did not equal the production of the parents, on the average. When low producers were mated the daughters did not take after either or both of the parents, but showed a higher egg production than the sires or sire's dams. This is according to the law of progression and regression. There is a pull up or down to a general level or average. Those are all problems that require years of careful investigation to determine, but so far as our investigations have gone I think I can say that high egg production is the accumulated result of the selection of high production breeding stock carried on for many generations. The breeder will, however, make rapid progress in identifying the exceptional individuals that possess in a high degree the power of transmitting the desired characteristic to the offspring.

As to the second point, which has reference to breeds, is there any evidence that one breed excels another in egg laying? There is a mass of evidence. The advertising pages of poultry papers are filled with evidence. There are over 100 different breeds and varieties and one can find evidence in the advertising pages that each of them is the laying breed. A great amount of evidence. But it is all bewildering—it cannot all be true. These breeders, most of them, do not purposely deceive. They have found a good hen or a good laying pen of their breed and they conclude that all the hens and all the pens of that breed are good layers, and they advertise the fact as they believe it.

In our experiments we have not tested all the breeds and varieties. That would be out of the question. I do not think it necessary. A great many of our breeds, especially our American-made breeds are pretty closely related. They are all practically from the same original stock not many years back, and until within the past few years they have not been bred in a way to establish any great difference in productive qualities. I think it is safe to state thus, that there are good and poor layers in all breeds. That is, in the modern utility breeds, in the Mediterranean, in the Asiatic, in the American, the English, etc., and whether one breed excels another in production or not is a question of their breeding, not of the breed. I think this fact cannot be too strongly of too often reiterated, that there is little, if any, difference in breeds so far as egg laying goes. This changing from one breed to another every year is bad business if it is eggs that are sought.

While this is true in general, I believe it should also be said that there

are some differences in races or classes, though there are none in breeds and varieties worth considering. Between the Barred Plymouth Rock and all other varieties of Rocks and all other American breeds, there should be little or no difference.

Between the Mediterraneans of small size and the Asiatics, for example, of a large size, I believe there are differences in production. The small, active fowl, other things being equal, is a better or more economical producer than the large fowl, and where one is seeking only after egg production, he should choose a small breed. It will matter little, however, what breed it is, so long as it is one of the small utility breeds. It seems to be a law of nature in the animal kingdom, that heavy producers are small in size, active and nervous. This is true in the case of the hen that lays, of the cow giving milk, or the race horse showing speed.

It is another question whether the best egg producer is on the whole the most profitable fowl. The poultry business cannot be conducted on a basis of eggs alone. The poultryman must produce meat in order to get eggs. He cannot eliminate the cockrels. He must expect half the chicks he hatches will develop into males, that have not yet gotten the laying habit. These must be marketed and the larger breeds, of course, sell for more than the small breeds. Again, the laying hen does not improve with age or experience. Her production decreases year after year. The flock must be sold off at least every two years. The Plymouth Rock or breeds of that size will sell for about twice as much as the Leghorns. However, I am not discussing meat qualities. We should discourage, as much as possible, the idea of breed differences when it comes to egg production. We will develop strains or breeds that have a claim as high producers, but until this is done there is no use encouraging the idea that layers may be selected on the basis of breeds and varieties.

As to the third point, type and conformation. Is there any type in layers? Is there any shape or form that indicates good laying qualities? I have only time to say a few words on this point. I mention a few characteristics that will be found present in the good layer and absent in the poor. It has been found that within the breed or variety, the heavier producers on the average, are those of lighter weight. Sometimes some of the heavy hens are heavy producers, but this is not true of the average. At the Oregon Station a pen of 47 Plymouth Rock hens averaged 160.9 eggs, separating them according to weight into three groups, we got this result. Those having an average weight of 7 pounds produced in the first year 141.1 eggs. Those of light weight, averaging 5 pounds, produced 173.7 eggs. In their second year's production the same thing is shown, the medium and lighter weights produced more than the heavy weights. The 11 heaviest layers, those laying over 200 eggs, averaged in weight 5¾ pounds.

There is a point here for breed makers to consider. I believe it to be undeniable that if we breed for large size or if we increase the size of the fowls of any breed, we will decrease the egg yield on the average. It would be a serious mistake, however, to select year after year the smallest individuals for breeding purposes without regard to other consideration. Vigor and health must always be uppermost. Continued selection of the smallest would in the Leghorn breed, for example, finally evolve a Bantam type so far as weight is concerned. On the other hand, it is a mistake to pick out the nice large hens and the heavy males and save them for breeding, where eggs are the object. Better send those to the pot.

When it comes to type we can only speak in very general terms. The good layer is usually medium to long in body and rather deep and broad. These are relative terms and subject to breed differences. Emphasis is placed on these points as indicating good digestive capacity. There are, however, good layers with short bodies and poor layers with long bodies. The truth is that hens have not been bred systematically for high egg laying long enough to fix or develop any particular type as it relates to shape. The same can be said of the angle of the tail and the shape of the comb, though preference should be given to a rather large comb and a tail carried rather high and there have been very notable exceptions to this in our breeding. The head, I think on the average, will be rather small and leg bones not too

large or coarse. In general make-up, the fowls should not have what might be called beefy build, rather a trim, muscular build. The comb should be of fine texture. The hen at the end of the year that is ragged in plumage and wrinkled in face, in other words, the one that shows the effect of hard work, is more often the one that has been doing the laying.

As to the hen temperament. I believe the temperament of the hen is strongly indicative of her laying capacity. The good layer has an active disposition and nervous temperament. She moves around quickly and is on the go more than the poor layer. She does not pose well either in the exhibition coop or before the camera. She will be found scratching and hustling for food after the poor layer has quit the job or gone to roost, and she will usually be at work early in the morning.

As to the last point, the question of laying maturity. I think we have here something of very practical importance. If you have 100 pullets all hatched about the same time in March or April, and they have been given good care throughout the brooding and growing periods, you will find, if they are of average stock, that a very few of them will lay at 5 months, a few at 6, and probably half of them at 7 months, and the balance at 8 or 9 months, with probably one or two that never lay. Summarizing the results of our work at the Oregon Station brings us to the following conclusions: The early layer is the best layer. If you will observe them carefully you will be able, I think, very definitely to pick out in the fall from the 100 pullets, a flock that will average 200 eggs in the year. I say this without any question of doubt. Our records show that those pullets that begin to lay in less than 200 days from the date they were hatched laid on the average of 200 eggs in the year. That is something easy to remember. The 200-egg hen lays on the average at an age of less than 200 days. They show also that those pullets that do not lay till they are 300 days of age lay half as many eggs as the others. Those, of course, can be killed off and sent to market. From 200 to 250 days you will get good average producers. From 250 to 300 days they may make a profit, depending on the cost of feeding.

Another standard that can be followed is the following; also taken from our records. This will involve trap-nesting the fowls for three months. By trap-nesting them for three months of November, December and January, by that I mean pullets that come to laying maturity about the first of November, we found that those that laid over 30 eggs during those months laid on the average 200 eggs or better during the year. Those that laid about 5 eggs during those months laid about 50 during the year. Those that laid 20 during those months laid about 150.

I have been very greatly interested in the way these records have developed along this line. I believe in a few years by following this method the poultryman may increase very greatly the egg yield of his flock. I don't mean to be understood in this that in all cases of indiviual hens the results work out this way. It sometimes happens that an early producer makes a good annual record. We must, however, consider the averages and we can afford to sacrifice a few good producers if we can by following this method select a flock that averages high.

While the trap-nest will be the most accurate in selecting the early layer, there are other ways in which she may be discovered. A large red comb is almost a certain indication of laying. A flexible abdomen, good depth from the pelvic bones to the keel bone and also rather wide between the pelvic bones, are pretty good indications of laying maturity. The most accurate method, however, is the trap-nest and if one can use trap-nests for one month, or three months, he may at the end of that time discard them and be assured from the records during that period that he can pick out the good layers for the year, as well as those that won't pay for their keep.

DEMONSTRATION IN SELECTING LAYERS

A good many years ago, I stated that it was possible to select the good layers and to cull the drones from my flock, judging solely by external appearances. I advocated this method and gave the system which we had found satisfactory after comparing the results of our selection with actual trap-nest records. It did not vary but a trifle once in a hundred cases. I

was one of the first to advocate such a system and pushed it strongly in spite of opposition and ridicule on the part of many would-be authorities and experts. More or less progress was made and hundreds swore by our system after giving it a trial, but others condemned it and refused to use or advocate it merely through prejudice. They apparently hated to acknowledge that anyone else knew anything but themselves. But the great world war came on, feed went to almost prohibitive prices, and the poultry authorities and poultrymen everywhere saw they would have to adopt some method of selection and getting rid of the drones and of all dead weight and unprofitable birds. These conditions forced them to do something and to try out some method. State Experiment Stations, Agricultural Colleges, the Governmental Department, and poultrymen in their desperation tried out various things. They finally, almost universally, adopted and recommended the very identical things which are found in these two lessons and in lessons 10 and 11 following these, methods which we had tried out and had been recommending for several years previous to this time. Since then State and Government agents and representatives have gone from farm to farm giving public demonstrations as to how the work is done. As a result, millions of unprofitable hens have been put on the market. For your information as to how this work is done we will quote the remarks made by Prof. H. C. Knandal at a demonstration which he gave in Pennsylvania during the month of August:

"Last year in Pennsylvania I went over about 12,000 individual hens on different farms, holding demonstrations, so that the farmer, and others who were present, could go home and select their own hens. They were able to tell the good hens from the poor ones, as you will be able to do when we get through here this afternoon. Out of those 12,000 hens I found there were 51 per cent that would be better off if they were in the pot.

Compares Two Hens and Gives Their Egg Records

"I now want to show you this poster. This shows the actual photographs of two hens that we have up at the college at the present time. Both hens are now living. These hens were hatched at the same time, in April, 1914. The poorer hen began to lay in January the following year. That is the first thing to condemn that hen. There is no money in the poultry business today if we have to wait NINE MONTHS for a hen to reach maturity.

"This other individual—she was hatched at the same time, in the same incubator, brooded in the same brooder, given the same food and care and management as the poor individual, but came into laying November 17. That is, when eggs were high in price this individual WAS LAYING EGGS.

"Now with regard to their time of molt. The poorer hen began her molt in her first year, July 7; that is, she laid from January to July 7. The good hen did not molt until November, coming into laying as I told you, November 17 and on November 18, the following year, she went into molt. THAT IS THE TYPE OF AN INDIVIDUAL THAT WE OUGHT TO HAVE ON OUR FARMS.

"The hen that went into molt July 7, many farmers would say would lay winter eggs and lay eggs when eggs were high in price. Such is not the case, however, as has been proven by hundreds of trap-nest records. I have never yet seen a flock of old hens that will give 50 per cent production through the months of November, December and January, but I have repeatedly seen flocks of healthy pullets that would average 50 per cent in November. THEREFORE, PULLETS ARE ESSENTIAL TO HIGH WINTER EGG YIELD.

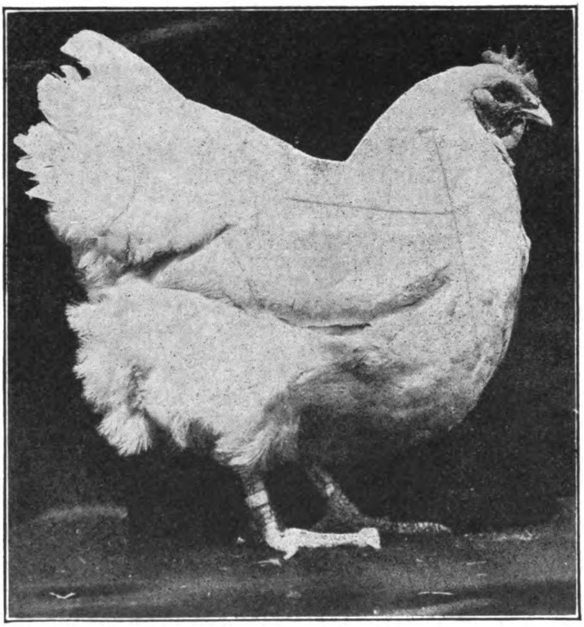
"The poorer hen, which I show you here, took 242 days to go through her molt. Some farmers would say that she would molt early and then get back early into the laying by fall or winter. Instead of that she came back into laying March 22. When eggs got cheap, she decided she wanted to lay; but from July 7 to March 27 that hen DIDN'T DO ANYTHING BUT EAT FEED AND LOAF.

"Now this good hen lost only forty-nine days in the molt from the time she laid her last egg until she laid her first egg on the second year. Only 49 days lost in the molt—just exactly seven weeks. The poorer hen

in her first year laid fifty-one eggs. The good hen in the same period laid 199 eggs—not an exceptional number of eggs, but yet a generous amount.

Consider the Difference in Cash Returns

"The second year this poorer hen laid 48 eggs, and the good one 190. This year the poorer hen has laid 40 eggs until the first of May, and she has not laid an egg since. The good hen, up until the 28th of July—and I haven't received the record since then—had laid 148 eggs this year. THAT IS THE TYPE OF INDIVIDUAL WE OUGHT TO BREED FROM. She has everything in her favor. She came to maturity early, laid a goodly number of eggs, molted late as a yearling and was back into laying the forepart of the month of January. During her second year she produced a large number of eggs and bids fair to repeat this her third year.



This white Orpington hen laid 245 eggs in twelve months. She made the highest winter record of any individual hen in a flock of fifteen hundred, all varieties competing. The hen was beautiful in color and shape, and could win first prize in the hottest kind of a class of White Orpingtons.

"The poorer hen in her second year lost 284 days in the molt—242 days her first year and 284 days her second year; and she has not laid an egg since May 1 of this year. She will do well if she comes back into laying next April."

Demonstrates With Two Sample Hens

Prof. Knandel took two S. C. White Leghorn hens, a good layer and a poor one, to demonstrate the difference and to actually show the method of selection. As you read on, imagine the two hens being held up to your view.

"In selecting poultry there is one fundamental we must understand, namely: HOW TO DETECT WHETHER A HEN IS LAYING OR NOT. If we don't know whether or not the hen is laying, our demonstration is not going to go very far. We have to be absolutely sure whether or not the hen is laying. Now, it is true that we have hens here that are the extremes. I think it is well, at first anyway, in conducting a demonstration, to have the extreme individuals.

"As we hold these birds up here in front of you, I believe there is no doubt which hen the majority of you would pick out as being in laying condition at the present time. Probably you would all pick the hen that I have here as the one in good laying condition at this time. This bird as a pullet during the five poorest laying months in the year—October, November, December, January and February—at which time eggs are always highest in price—laid 109 eggs. If she laid 109 eggs during those five months, what must she have laid when eggs were fairly cheap in price, in March, April, May and June, when any old hen lays? IT IS VERY CHARACTERISTIC OF OUR POOR PRODUCERS TO LAY WHEN EGGS ARE CHEAP.

"Now, as we hold these hens up to show you, one of the big differences between these two hens is the comb. It may be, also, that the plumage appears to some of you to be different, and to some the color of the beak is different, or the color of the shank, or the color of the ear-lobe will appear to be different. All these factors must be taken into consideration in telling a good hen from a poor one. Of course the only sure way of knowing the egg production of an individual is by the trap-nest. Even by that we sometimes go astray, because some hens don't lay in the trap-nest; but to be actually sure, that is probably the only way that we know of at present to tell what a hen has laid. However, we feel confident that we can tell BY EXTERNAL CHARACTERISTICS the practical distinction between the good hen and the poor one. In many cases, where the trap-nest has been used so that the actual record of the bird is known, we have been able to come within twelve to fifteen, sometimes within three eggs of what the actual trap-nest record of that bird was, by judging from external characteristics.

"I cannot tell anything about the production of a hen in February, March, April or May. If anyone would like selection work done at that time, don't call on me, because I could not do it. The poor hen might have looked just as productive as the good hen last March and April when she was producing eggs. Last March or April her comb wasn't shriveled up like it is now. Her comb might have been just as large as any hen's comb and it might not have been. At this time of the year, through July and August, and even September and October, we can tell more about the production of a hen than we can at any other time of the year. We prefer to select hens from external characteristics in the months of July, August, September and October, although some work has been done as late as November and even in December.

Goes Over Hen, Section by Section

"Let us go over these birds in detail. We will begin with the head, because that is always the practical place to begin. The comb of the laying bird presents a waxy appearance. It is large, fat, greasy, and has a very waxy touch, while the comb of the non-laying hen is shriveled, and has more or less of what we call dandruff on it, so that there is a great deal of difference between the combs of the two individuals. Then if you look at the color of the beak in these two birds, you will see that there is a great difference. The difference in the color of the beaks now is due to a factor we will mention in just a few moments—the matter of stored up fat.

"Next, in regard to the ear-lobe. You will see that the poor hen has yellow ear-lobes and the good one white ear-lobes. Then as to the shanks, there is a great deal of difference in the color. The poorer hen has the yellow shank, the yellow beak, the yellow ear-lobe. While the good hen has the white shank, the white beak and the white ear-lobe.

"Sometimes we find a hen with a red comb and a hen that appears to be in laying condition, but yet is not laying. The only way of telling whether that hen is in laying condition is by the condition and color of the vent. The vent is the first part of the bird which begins to indicate egg-production. It takes in the neighborhood of six to eight or ten eggs for the color of the vent to be bleached out from a yellow to a flesh color. The good hen shows the real white or flesh color around the vent. The poorer hen shows a real yellow color around the vent and is more or less shriveled in appearance. This poorer hen has probably not produced any eggs for the

last three or four weeks, while this other hen has been in a good, heavy production all this time.

"One important factor that we use and lay a great deal of emphasis on, is in the molt of the individual. This good hen has not lost any of her feathers. They are still tight on her; her wing feathers are still old feathers and she has not lost or shed a single feather. The other individual is beginning to put on her new coat; her new feathers are coming in on her back and new feathers are being put on her neck. A hen always begins to shed first on her neck. This bird probably started to molt sometime within the last four or five weeks. Even her tail feathers are beginning to come out. You can see the difference in the wing. She has just dropped the middle feather in the wing, and started to grow the other one.

Select Broad Backs, Also "Capacity"

"You have another factor to use—namely, the condition of the back. We like to find a bird with a broad back, a well formed back like the back of the hen I have here—very, very broad, while this other individual has a really small, sunken-in back, and as I say, the only way that you will ever get to know those conditions is by actually feeling the hens—noting these ACTUAL CONDITIONS.

"There is one other factor I should mention. Some people term it 'capacity.' Term it whatever you will, but we mean the distance from the end of the breast bones to the pelvic bones. (The two pelvic bones are found one on each side of the vent. They are just above the point of the breast bone and just below the tail. The distance between these bones and their straightness indicates the ease with which a hen lays. These bones are rather wide apart and straight in the best hens. If these bones are thin from side to side it indicates that the bird is of an egg type. If the flesh and bones are fat and thick and rigid it indicates that the hen is of a meat type and will lay but few eggs.) This distance between the end of the breast bone and points of pelvic bones varies a great deal with the hens, and varies a great deal with the condition of the bird. This hen has, at the present time, only a two-finger capacity; that is, only two fingers can be placed between the end of the breast bones and the pelvic bones, showing you that this bird is greatly pinched up in the abdomen. She has not the capacity or the room to make eggs; while with this good individual, we are able to place at least four fingers from the end of the breast bone to the pelvic bones.

"The point in these birds is this: when the good hen ceases to lay her breast bones will crowd up to her pelvic bones, and there won't be this great difference that there is now, and the poorer hen, when she comes into laying, will not have this small distance that she has now because, due to her laying, her breast bone will gradually drop down. In using capacity, we should compare Leghorns with Leghorns and individuals of the same breed. The greater the capacity, the better the bird, provided she has the other characteristics outlined above.

"Now then, to sum up the points that we look for in selecting good hens from the poor ones: The first thing we look for, of course, is to see whether that bird is in good condition. And I might emphasize one other factor. Really the first thing we look for is the physical condition of the bird; we actually want to have birds 'physically fit.' Their condition must be up to A-1 in order to be productive. All of the birds we have here are healthy. If they had a disease such as canker, or any disease we, of course, would discard them.

"The next factor is the molt. Any bird that has not molted by the middle of September, we would keep in the flock as a profitable bird, but you had better keep in the flock, if possible, only birds which do not molt until the first of October or after that. These birds are often hard to find. This good individual here won't, or should not, commence to molt for at least six weeks. The hen which has not molted by the middle of September is a pretty good individual, and as a rule you better hold on to her. By next spring you can use her as a breeder. But if you don't mark her this fall, there is absolutely no way that you can tell her next spring that I know

of. The best time to mark our breeding stock is in the fall, when you know whether a hen is good or poor.

"The question often is raised as to how long it is profitable to keep a hen. I would not care whether this good hen was ten years old, if she was still in good laying condition at this time of the year, I would keep her. That good hen that you see on the poster is laying eggs in her fourth year and is still used as a breeder.

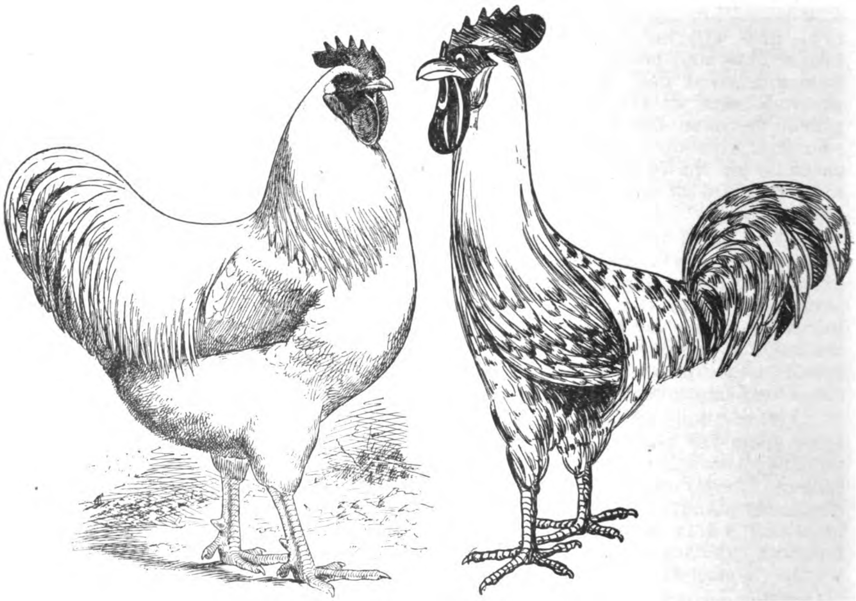
"After the molt we look for the color in the beak, the color in the ear-lobe and the color in the shank. If that is yellow in August or July, or the first of September, that hen has taken a vacation for you and you had best see that she is given an unlimited vacation. Get rid of her at once.

"Question: Has the white of the eye anything to do with the laying qualities of the hen?

"Prof. Knandel: Nothing that I know of, if you mean the eye itself. That yellow color in the poorer bird is nothing more than fat which is stored up in the body of the bird. That fat, as the hen lays her eggs, is gradually taken out from her body and gradually drawn out from her shanks and her beak and her ear-lobes, in fact wherever there is a surplus. This fat is put into the yolk of the eggs. That is the reason that your heavy producer has the white shank at this time of the year. You have the same proposition with your dairy cow. Your fat dairy cow, your good-proportioned cow, takes that fat off and puts it into the milk pail. It is the same thing with the good hen. She takes the fat off of her body and puts it into the yolk of the egg.

Best Time to Sell Average Hens

"The best time to sell your poor hens is when they cease laying. Usually the first of September prices are high and all drones should be sold



On the left is shown a bird of uniform type, one that is beautiful in shape and color, and one where there is vitality coursing through every vein of his body. This bird shows he is symmetrical in all sections. Such a bird is able to produce offspring that are good for either meat or eggs. On the right is shown a bird of the opposite type. The body is short and more or less triangular. The comb is out of proportion. The neck is long and slender. The bird is lacking in breast. There is a sudden break at the base of tail. The bird is entirely out of proportion. You would say no one would breed from a specimen of this kind, yet there are thousands of people using specimens that are no better in shape at the head of their breeding pen.

then. You don't want to feed any more hens than you have to, any longer than you have to, with the price of feed where it is today.

"Question: Is the time of the molt the same with all breeds?

"Prof. Knandel: The better the hen is, the later she molts, regardless of the time she was hatched or the breed one has. The later your hen molts, the better she is. You all know of Lady Eglantine and of course many of you know she went into molt in November, following a record-laying period.

Showing the actual photographs of two hens which were trap-nested at the college, the speaker said:

"This good hen in her first year molted November 17; her second year, October 25. On a practical basis what would you do with this hen if this year she molts after September 15? We would keep her another year, because she would be profitable. If she molted before September I would expect that she has passed the point where it was profitable to keep her.

"Question: When a hen begins to molt, does she immediately stop laying?

"Prof. Knandel: No, some hens lay right through their entire molt. Even the hen has her pecularities. You cannot tell when a hen is going to molt. Today she may be laying and then tomorrow she will go right into a molt, and in the case of a high producing hen she will shed her feathers very quickly—seeming practically to throw them off. But few hens, if any, lay eggs at the same time they are growing feathers. She does not have the energy to grow feathers and lay eggs at the same time.

"Question: Does it make any difference in the time of molting if you take a flock of birds that have large quarters or small quarters? We have sixty-two chickens in small quarters and they are in a confined space.

Sudden Change of Feed Causes Molting

"Prof. Knandel: The question has been raised whether chickens confined to a small space would begin to molt quicker or later than hens having free range. I return again to the statement made before that the care given to a bird will in a large measure determine when that bird goes into the molt. These birds here, being fed properly a well-balanced ration, if changed and fed nothing but corn for the next week, many of them would go into the molt inside of ten days. Now then, if you change your feed very, very abruptly there is probably nothing that will send any birds into the molt quicker at this time of the year. If you change your feed gradually, mixing in the new feed a little at a time, that is a different proposition. This is the way any ration should be changed.

"Question: Does it pay to change the feed when the hen is molting?

"Prof. Knandel: I would not change the feed any more than I had to. Some farmers do have to. I would not keep changing the feed. If you find a good feed, I would stick to it. Oil meal and sunflower seed when fed in moderate amounts aid in the growing of new feathers.

"Question: What per cent of egg production would you have to have at the present time to make a profit?

"Prof. Knandel: That will take a little figuring. I would not know except in a general way. Referring to the man, where we had a demonstration in Armstrong County, and where the farmer kept account of his feed alone, not taking into consideration the depreciation, interest on his money, etc., it cost him $10.25 to feed ninety-nine hens for thirty-one days. There remained from his good hens, after his feed bill was paid, $47.25, and certainly that is a pretty good profit above feed costs. The 98 poor hens at the same time returned him a loss of $13.00, and he had to take care care of them for the fun of it."

INVALUABLE FACTS FROM DR. PEARL ABOUT BREEDING FOR EGG PRODUCTION

(An address delivered before the American Poultry Association by Dr. Raymond Pearl, Biologist, Maine Agricultural Experiment Station, Orono, Maine.)

No investigator in America has made a more thorough study of the

underlying principles of egg production than Dr. Pearl. Every paragraph of the following address is worthy of the closest study:

"It is safe to say that there never has been so keen and wide-spread an interest in the improvement of poultry in respect to egg production as exists at the present time. All over the world poultry keepers are waking to the fact that some hens lay more than others: that it costs no more to hatch, rear, and care for those that lay more; and that they want this sort in their flocks.

"There would seem to be little doubt that this awakening is due in considerable degree, at least, to the rapid development during the last ten years of egg laying contests in different parts of the world. We are indebted for the inauguration of such contests on a large scale to the enterprise of the Australians. In recent years we have seen their development in this country. It seems likely that we shall see a much further growth of the laying contest idea in the United States, as well as in European countries. To be sure, some of our friends of the poultry press, who apparently see nothing of value in laying tests of any sort, have been predicting that the laying competition has about run its course, and that the end is now in sight; that we are in point of fact, witnessing its last decline before utter extinction. Unprejudiced observation, however, would seem to indicate that these contests make a strong appeal to the poultry public. It is difficult to conceive of any single measure better calculated to arouse general interest in poultry keeping, and to call attention to the results which follow care and breeding. In other words, the educational value of laying contests would seem to be beyond question. That they can be so conducted as to contribute to existing knowledge of the laws of egg production also is beyond doubt. I have recently had the opportunity of examining the detailed plans for the conduct of a series of such laying competitions, which are to be undertaken, with government subsidies, in two European countries. There can be no question that these plans, if carried out, will contribute materially to scientific knowledge of the laws of egg production.

"Underlying the immediate stimulus afforded by the laying contests are to be found two fundamental reasons for the present interest and activity in the direction of improving egg production. These are:

"(a) The poultryman's belief that egg production is an inherited character. In holding this opinion he is certainly quite correct. One might, indeed, say 'knowledge" instead of 'belief' here.

"(b) His belief that any character which is inherited is capable of improvement by intelligent breeding. Again, this belief is entirely well founded provided only that an exception be made for characters (if there be any such), in which all possible improvement in innate hereditary constitution has already been made.

"To say, as we have above, that 'egg production' is an inherited character is not quite enough. This might be taken to mean only the fact that the mode of reproduction, characteristic of birds—which is to say reproduction by means of eggs with albuminous and calcarous envelopes—is an innate and hereditarily fixed matter in the fowl. But the poultryman is interested, as well as the investigator in the field of genetics, in something more than this. He wants to know whether the *differences* which he observes in egg-laying capabilities amongst different breeds, or flocks, or finally individuals, are inherited. General observations indicate to the poultryman that at bottom the foundaton of a great many of these differences in laying ability with which he is familiar is hereditary. But how? And under what limitations? For plainly this is not a simple matter. If it were, none of our hens now would ever lay less than 200 eggs per annum, except in the case of remote back woods regions, where the gospel of the trap-nest had not yet penetrated. Trap-nest selection of high producers has opened the eyes of the poultryman to one thing certainly, even though it may have obscured his vision in other directions. This thing which is clearest is that all high producing hens are not equally capable of transmitting this valuable quality to their progeny. So that while it may be perfectly certain that the difference between a 200-egg producer and a 50-egg producer is in some way or other a hereditary difference, we shall not get

far towards a practical utilization of this fact until we know something more about its nature.

"So, then, the first essential step to be taken towards the improvement of egg prdouction by breeding is to find out the way in which variations or differences in producing ability are inherited. For some six years past I have devoted considerable attention to this problem, with results which have been set forth in detail in a series of papers from the Biological Laboratory of the Maine Agricultural Experiment Station. The most recent of these papers is Bulletin 205, which has the title, 'The Mode of Inheritance of Fecundity in the Domestic Fowl.' This bulletin is technical in character. It was not written for the poultryman but for the professional student of genetics. On this account it has apparently not been quite clearly understood by some poultrymen, and the results and conclusions have in some cases, been misinterpreted. It will be my endeavor here, as briefly as possible, to make clear the essential results of our studies.

"First as to the facts: The following are simple statements of the actual results obtained in trap-nesting Barred Plymouth Rocks and Cornish Indian Games, and all possible sorts of crosses between these breeds, over a period, collectively, of nearly fifteen years. The total number of birds involved in these trap-nesting operations has been large, aggregating, all told, between five and six thousand individuals. Out of these records, the following facts clearly appear:

"1. The record of egg production of a hen, taken by itself alone, gives no definite, reliable indication from which the probable egg production of her daughters may be predicted. Furthermore, mass selection on the basis of egg laying records of females alone, even though long continued and stringent in character, failed completely to produce any steady change in type in the direction of selection.

"2. Differences in egg producing ability are, in spite of the above results, certainly inherited. There are two lines of evidence showing that this is the case. The first is that derived from the general observation that there are widely distinct and permanent (under ordinary breeding) differences in respect to egg laying ability between different breeds of fowls, and between different strains in the same breed. In the second place, a study of pedigree records of poultry at once discovers pedigree lines in each of which a definite, particular degree of egg producting ability constantly reappears generation after generation, the 'line' thus 'breeding true' in this particular. With all birds kept under the same general environmental conditions such a result can only mean that the character is in some manner inherited.

"3. The number of visible oocysts on the ovary bears no definite relation to the actually realized egg production.

"4. This can only mean that observed differences (variations) in actual egg production depend upon differences in the complex physiological mechanism concerned with the development of oocysts, and the separation of them from the ovary and the body (laying).

"For reasons that cannot be gone into here on account of lack of time, attention has been focused during the latter phases of my study on winter egg production. From this point on we will, therefore, remember that we are confining the discussion to winter egg production.

"5. It is found to be the case that birds fall into three well-defined classes in respect to winter egg production. These include (a) birds with *high* winter records, (b) birds with *low* winter records, and (c) birds which do not lay at all in the winter period. The division point between *a* and *b* for the Barred Plymouth Rock used in these experiments falls at a production of about thirty eggs.

"The next step is to inquire for each of these classes separately how egg producing ability is inherited within the class. We may first deal with high egg production.

"6. *High productiveness* may be inherited by daughters from their sire, independent of the dam. This is proved by a mass of detailed concrete evidence, presented in the complete paper. This evidence consists of the results of mating after mating, in which the same proportions of daugh-

ters of high laying ability are produced by the same sire, whether he is mated with dams which are poor layers or with dams which are high layers.

"7. *High laying ability* is *not* directly inherited by daughters from their dam. This is proved by a number of distinct and independent lines of evidence, of which the most important are: (a) that continued selection of high producing dams does not alone alter in any way the mean egg production of the daughters. If an alteration does appear in any case following such selection, further analysis shows that some additional element other than the dam's egg record came into account in making the selections of breeders. (b) The proportion of high producing daughters is the same whether the dam is of high or low fecundity, provided both are mated to the same male; (c) the daughters of a high producing dam may be either high layers or poor layers, depending upon their sire; (d) the proportion of daughters which are medium or poor layers is the same whether the dam is a high or poor producer, provided both are mated to the same male.

"8. Mediocre or poor laying ability may be inherited by the daughters from either sire or dam, or both.

"Now, all of these eight points are merely statements of fact. They are the results which any intelligent person who examined our extensive trap-nest and pedigree records would be bound to reach. They depend in no way upon any 'theory' of inheritance. I can assure those to whom Mendelism is as the proverbial red bag to the bull that nothing which has been said so far is even to the slightest degree tainted with this dreadful (?) doctrine.

"An isolated fact does not alone contribute to the body of organized knowledge known as science. Its relation to other facts must first be understood. Now, the facts regarding egg production which have been set forth above do, as a matter of fact, accord in a remarkably clear manner with a Mendelian interpretation which has been worked out in detail in bulletin 205. Through this interpretation this isolated group of facts is brought into relation with a much wider range of facts about inheritance in poultry and other animals. In this way we are better able to understand (in the light of present knowledge) the meaning of our facts, and, on this basis, make plans for investigations which shall take us again a little further into the realm of the unknown, beyond the boundaries of our present knowledge.

"But what is the good of all this? How is it going to help John Smith to win first prize in an egg laying competition? It must be said at the outstart that, much to my regret, neither the facts nor their Mendelian interpretation will furnish any neat little rule-of-three whereby all John Smiths can win all first prizes. Successful poultry breeding will continue in the future, as it has in the past, to demand a lot of intelligence, thought, skill and rationally directed effort. I hope and believe, however, that the results discussed above may be of some help in efforts to improve egg production by breeding. It is farthest from my desire to claim too much for them, but I do think they help us a little in certain general directions. In the first place these results, by showing that the inheritance of egg producing ability is not a simple, uncomplicated transmission of something from dam to daughter without change, make it somewhat easier to bear the disappointments which attend devotion to the gospel of the trap-nest, in its original inspirational form. In the second place, they help us to make a more just and adequate distribution of emphasis upon the different basic elements of a systematic plan for the improvement of poultry in egg production. Finally, by furnishing a generalized mode of interpretation of observed results, or in other words, by giving a clearer and broader *understanding* of how egg production is inherited these results help us to interpret, and profit in our own breeding operations by the experience of others.

"It would be very easily possible to make out a system of matings, on the basis of the results of Bulletin 205, showing in a great detail how to proceed toward building up a laying strain. Indeed, such specific plans have been worked out by a number of my friends. I have refrained from doing this, however, because it seems to me to be of doubtful practical utility. Lest I should seem to be repudiating both my results and my friends, let me hasten to give my reason for this doubt. The reasons are general in character and are found in the fact that such schemes of mating are essen-

tially *mechanical*, whereas both the things to be bred in accordance with the scheme (the fowls) and those who are to carry out the plans (the poultrymen) are essentially *living*. Perhaps in final analysis the basis of life may be mechanistic, but certainly living things do not in practical everyday life behave with that precision and definiteness which we expect from a machine. Being a little acquainted with thme frailties of both poultry and poultrymen, I am not too optimistic as to the outcome of trying to breed chickens by formula.

"It seems to me that possibly it may be more helpful to try to draw out from these results some general principles in breeding for egg production, which every poultryman can apply. What then are the basic elements in a well directed effort towards the improvement of *poultry* in egg production by breeding? I should put them in this way:

"1. Selection of all breeding birds *first* on the basis of *constitutional vigor and vitality*, making the judgment of this as far objective as possible. In particular the scales should be called on to furnish evidence. (a) There ought to exist, for all Standard breeds of fowls, normal growth curves, from which could be read off the Standard weight which should be attained by a sound, vigorous bird, not specially fed for fattening, at each particular age, from hatching to the adult condition. These curves we shall sometime have. (b) Let all deaths in shell, and chick mortality, be charged against the dam, and only those females used as breeders a second time which show a high record of performance in respect to the vitality of their chicks, whether in the egg or out of it. This constitutes one of the most valuable measures of constitutional vigor and vitality which we have. If for no other reason than to measure this breeding performance, a portion of the breeding females each year should be pullets. In this way one can in time build up an elite stock with reference to hatching quality of eggs, and livability of chicks. (c) Let no bird be used as a breeder which is known ever to have been ill, to however slight degree. In order to know something about this, why not put an extra leg band on every bird, chick, or adult, when it shows the first sign of indisposition? This then becomes a permanent brand, which marks this individual as one which *failed*, to greater or less degree, to stand up under its environmental measures of constitutional vigor. (d) Many of the bodily stigmata by which the poultryman, during the past few years, has been taught to recognize constitutional vigor, or its absence, have, in my experience, little if any real significance. Longevity is a real and valuable objective test of vigor and vitality, but it is of only limited practical usefulness, because of the increasing difficulty, with advancing age, of breeding successfully on any large scale from old birds of the American and other heavy types.

"2. The use of breeders of such females only as have shown themselves by trap-nest records to be high producers, since it is only from such females that there can be any hope of getting males capable of transmitting high laying qualities.

"3. The use as breeders of such males only as are known to be the sons of high producing dams, since only from such males can we expect to get high producing daughters.

"4 The use of a pedigree system, whereby it will be possible at least to tell what individual *male* bird was the sire of any particular female. This amounts, in ordinary parlance, to a *pen* pedigree system. Such a system is not difficult to operate. Indeed, many poultrymen, especially fanciers, now make use of pen pedigree records.

"5. The making at first of as many different matings as possible. This means the use of as many different male birds as possible, which will further imply small matings with only comparatively few females with each male.

"6. Continued, though not too narrow, *inbreeding* (or line breeding) of those lines in which the trap-nest records show a preponderant number of daughters to be high producers. One should not discard all but the single best line, but should keep a half dozen, at least, of the lines which throw the highest proportions of high layers, breeding each line within itself.

"Items 4, 5 and 6 imply the carrying over of a considerable number of cockerels until some judgment has been formed of the worth of their lines, through the performance at the trap-nest of their sisters.

"Item 6 assumes, as an absolutely necessary prerequisite, that item 1 be faithfully and unfailingly observed.

"The whole system of breeding here outlined is an application in the simplest form possible of two principles, one general and the other special to the present case.

"The first is the general principle of *the progeny test in breeding for performance.* This is the principle which has led the plant breeder to such notable triumphs during the last fifteen years. In my judgment no system of breeding for performance in animals not fundamentally based upon it will ever achieve any permanent success. *The second principle is the recognition of the significance of the male in breeding for egg production.* It has been the custom in trap-nesting work to reckon pedigrees in the female line only. This we can now see to be an essentially futile procedure, so far as concerns the daughters. To say that 'this pullet is the daughter of Lady Splendissima (with a tremendous record)' is perhaps good advertising. It conveys no information, however, of any special value to the breeder, until he knows who was the Lady's consort in this particular reproductive venture.

"In closing let me express my conviction that the plan of breeding for egg production set forth, which involves nothing in principle or practice which any poultryman cannot put into operation, will not fail, if consistently and intelligently followed, for a period of years, to bring about a material increase in the productivity of the flock. The evidence which leads me to this conclusion is the best of all evidence; I have tried it."

QUESTIONS ON THE PRINCIPLES OF MATING AND BREEDING
LESSON NO. 9

1. What object has a hen in laying and why do they lay more today than when in their wild state?

2. Can a reasonable amount of eggs and beauty be combined in the same fowl? Why do some flocks have all beauty and but few eggs, and others of the same variety have all eggs and but little beauty?

3. What is meant by a good strain or a poor strain of any variety of poultry?

4. Why is it more important to be careful in the selection of a strain than it is in the selection of a variety?

5. Mention some of the characteristics by which you would determine whether a hen or pullet was of an egg strain or not, or state in a general way just how a good layer should appear.

6. Why is it that some pens from certain breeders will have a single hen in the pen which makes a high record and the remaining birds will be below the average?

7. What can you say about the influence of egg production on size? What effect has frequent laying on color of legs, beak, feathers and ear-lobes?

8. What are the advantages of breeding for longevity of both life and egg production?

9. Taking as evidence Dr. Pearl's statements and records, is high egg laying ability inherited from the sire or from the dam?

10. What should be the first basis of selection of all breeding birds?

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